THE PRACTITIONER:

A JOURNAL

OF

THERAPEUTICS AND PUBLIC HEALTH.

EDITED BY

T. LAUDER BRUNTON, M.D., F.R.S.,

Fellow of the Royal College of Physicians;
Assistant Physician to St Bartholomew's Hospital;
and
Lecturer on Materia Medica and Therapeutics in St. Bartholomew's Hospital School.

VOL. XXV.

JULY TO DECEMBER.

London:
MACMILLAN AND CO.
1880.

LONDON:
R. CLAY, SONS, AND TAYLOR,
BREAD STREET HILL, E.C.

CONTENTS OF VOL. XXV.

ORIGINAL COMMUNICATIONS :—

REVIEWS OF BOOKS :—

THE PRACTITIONER.

JULY, 1880.

Original Communications.

ON CATARRHAL PNEUMONIA AND TUBERCLE IN THE HUMAN LUNG.

BY D. J. HAMILTON, M.B., F.R.C.S. ED., L.R.C.P. ED.,

Demonstrator of Pathology, University of Edinburgh, Pathologist to the Edinburgh Royal Infirmary.

(*Continued from page* 423, Vol. xxiii.).

NOT only has tubercle a common structure in all situations in the human subject, but in the lower animals a structure identical with that which is called tubercle in man also prevails. In horned cattle, the disease is perfectly well known.[1] In the latter, it is so frequent as to form one of the scourges to be dreaded by cattle-breeders. It is known by various unscientific names in this country, but the name given to it in veterinary medicine is now usually "tubercle," showing that the close resemblance to the human disease has been recognised. In Germany it goes by the name of "Perlsucht" or "Franzosen-krankheit." It was long thought to be something different from the human disease by Continental pathologists, but recent observations have gone to establish their identity.

[1] I am informed by Mr. Williams, Principal of the new Veterinary College, Edinburgh, that caseation is more liable to occur in the organs and tissues of oxen than in any other of the domestic animals. This probably accounts for tubercle being such a common disease in them.

I have made very careful examination of the organs in several instances of this disease, and feel the utmost confidence in stating that in all respects the two diseases—human tubercle and the "Perlsucht" of oxen—are identical. They are identical in structure, and in their modes of development follow the same laws. Another point, which still further confirms their identity, is that the true "Perlsucht" tumours are always preceded by a softening caseous source of infection. The same misunderstanding exists in regard to this, however, which for long obscured, and, to some extent, still complicates the subject of tubercle in man—namely, that the caseous source of infection is mistaken for the tubercle itself. The infecting source may be situated in different parts of the body, in any tissue. It sometimes presents itself as a primary affection of bone, and in pleurisy a fertile source of caseation and tubercle propagation is to be found. The large caseous deposits seen in the pleura, or in the bronchial glands of oxen after pleurisy, are by many veterinary surgeons mistaken for tubercle, just as they were by practitioners of human medicine in former times. They, however, do not represent anything more than tissues which have undergone a gradual necrosis, and they are totally different from the tubercles which may arise from them.

In rabbits and guinea-pigs a similar disease occurs, and can be artificially produced by the injection of caseous material from the human subject. In the former, tubercle, arising from a caseous catarrhal pneumonia, is a common cause of emaciation and of death. The tubercle nodules here virtually have the same structure and appearance as in the human subject.

We are, therefore, justified in saying that tubercle is a tumour having a definite structure in different genera of animals, which is easily recognisable by microscopic examination. Where this structure is not present in a suspected tumour we have no right to call it by the name of "tubercle."

Having described in detail the histology of tubercle of the lung, it will now be advantageous to examine the method by which the primary form of it is developed. After investigating many instances of primary tubercle of the lung, I find that in all of them the first thing noticed is a little cellular projection on one side of an alveolus. From the fact of tubercle arising

in connection with the absorption of caseous *débris*, it might be supposed that embola should be detected in the vessels as the primary lesion. I have never been able, even after the most diligent search, to persuade myself that such is the case, probably from the absorbed caseous materials being small in size and amorphous in shape. Where three alveoli lie adjacent to each other, the embryo tubercle may project into the whole of them simultaneously. This projecting cellular mass is caused by an interstitial thickening of the alveolar wall, so that it can be easily understood how it may protrude into several alveoli simultaneously. It is not the result of a primary germination of the alveolar epithelium.

At first, the elevation is only faintly perceptible, but soon the alveolar thickening increases to such an extent that the previously sessile tumour comes to have a definite shape, and is somewhat pediculated. It grows into the alveolar cavity, and, as it does so, carries the alveolar capillaries with it. The alveolar epithelium can be seen, while the tumour is small, stretched over its surface. Fig. 19 shows a tubercle in this stage. On one side is represented a large branch of the pulmonary artery (*f*) injected with Prussian blue, while the alveolar walls are shown at *a*. A group of germinating cells (*e*) is seen firmly attached to, or rather incorporated with, the interstitial tissue of the air-vesicle, and projecting into its cavity. Capillary blood-vessels (*d*) filled with blood-corpuscles, have been drawn into it, and in this stage are still distinctly visible. They are all much engorged, and occasionally minute extravasations are visible, the blood-corpuscles being thrown into the alveolar cavity (*c*).

The cells of which the tumour at this time consists are large spherical or flat bodies with a well-defined nucleus (*e*). They have a granular appearance, and seem to be actively germinating. They are exactly like the connective tissue nuclei seen on the surface of œdematous and proliferating fibrous tissue, and, so far as I have been able to trace their origin, they seem to be formed either from the connective tissue elements of the alveolar wall, or from the endothelium of certain of its capillaries. Both of these appear to be sometimes drawn upon as formative sources, and from the similarity in their nature there is no

reason why they should not act as generating tissues. One thing is certain, both in primary and in secondary tubercle of the lung, namely, that the tumour originates from a connective tissue structure, and bears this character throughout.

It can be easily seen in Fig. 19, both from the abrupt manner in which the injection ends in the artery (*f*) as well as from the engorged state of the capillaries beyond, that there has been considerable retardation in the flow of blood through this part

Fig. 19.—Primary tubercle of the lung in a very early stage of development, × 400 diams. *a*, an alveolar wall; *b*, blood-corpuscles in capillaries of the same; *c*, blood-corpuscles extravasated into the alveolar cavities; *d*, alveolar capillaries filled with blood-corpuscles carried forwards by the tubercle, which is growing into the alveolar cavity; *e*, large endothelial-like cells, of which the tubercle in this stage is mainly composed; *f*, branch of the pulmonary artery injected, the injection terminating abruptly in the alveolar branches.

of the lung. When we consider how the capillaries are pushed or dragged into the alveolar cavity by the cellular mass the cause of this becomes evident. The tubercle growth in this stage, as will be observed, somewhat resembles a granulation, and, of course, where the alveolar capillaries are drawn out into this convex shape, and where they are attenuated, the blood must have great difficulty in circulating through them. The

bright scarlet colour and congested appearance of the lung in primary tubercular disease are thus accounted for. The blood is delayed in its circulation, and air freely entering the organ it becomes hyperoxygenated.

Before long, however, the character of a pediculated interstitial tumour invaginating itself into an air-vesicle is destroyed, and the tubercle nodule then comes to have a totally different character. The previously uniform free border which the tumour had (Fig. 19) now becomes destroyed, and the cells contained within the mass escape into the cavity of the air-vesicle. Similar alveolar thickenings form at different parts of the alveolar wall in the same way, and these opening into the air-vesicle produce great cellular distension of it. The capillary blood-vessels, which previously were clearly visible within the granulation mass, then become destroyed, so that the appearance presented by the tubercle in this stage is that of a group of three or more air-vesicles whose walls are only partially visible, and whose cavities are distended with large endothelial-like cells, with occasionally some blood-corpuscles.

It is in this stage that the tubercle growth somewhat resembles a catarrhal pneumonia, and it is now that it is so liable to be mistaken for an intra-alveolar or epithelial instead of an interstitial connective-tissue growth. The stage before this is not so easy to detect, seeing that by the time the disease proves fatal the most of the tubercles have advanced beyond it. It is this which evidently has in part misled M. Charcot, and has inclined him to believe in the identity of tubercle and catarrhal pneumonia. Both in primary and in secondary tubercle, however, and more especially in the latter, as we shall see, the distinction between the two diseases is so definite that no trained observer can possibly mistake them if sufficient attention be given to the subject. We shall have further proof of their non-identity when secondary tubercle of the lung is considered.

The tubercle growths having broken through the alveolar wall, the next thing capable of being observed is that the remains of the latter become incorporated with the large cells contained in the air-vesicles, so that a uniform rounded mass results, such as that represented in Fig. 13, in which the outlines of the original air-vesicles are barely recognisable.

In a catarrhal pneumonic nodule, on the other hand, the alveolar walls (Fig. 11) remain distinct, until destroyed by caseous degeneration. In this disease, also, the air-vesicles surrounding the nodule usually show more or less evidence of epithelial proliferation, but in tubercle the neighbouring air-sacs are comparatively free from any morbid change.

Besides growing in connection with the capillaries of the alveolar wall, it sometimes happens that the tubercle sprouts, parasite-like, from the inner coat of a large branch of the pulmonary artery. I have seen an instance of the lesion where the lumen of a moderately large-sized branch of the pulmonary artery was almost occluded in this way. The tumour seems to arise in connection with the arterial endothelium, but soon involves the tunica intima, leading to great thickening of it, and to the building up of a typical giant-cell tissue within it.

The origin of the giant-cells of tubercle has formed matter for great difference of opinion among pathologists since the time when they were discovered, as will be perceived from the following references :—

Virchow supposed that they were over-developed connective tissue corpuscles (*Virchow's Archiv.* vol. xiv. p. 51). Wagner stated that "he has several times seen a transformation of the branched cells of the (natural connective tissue) reticulum into the many branched and many nucleated giant-cells" (*Das tuberkelähnliche Lymphadenom*, Leipzig, 1871, S. 31). Klebs and Köster (*Virchow's Archiv.* vols. xliv. p. 286 and xlviii. p. 95), represented the giant-cells as transverse sections of capillary lymph vessels; and Langhans (*Virchow's Archiv.* vol. xlii p. 382) and Hering (*Histologische und experimentelle Studien über Tuberculose*, Berlin, 1873, p 105), adopted this view. Schüppel (*Archiv. der Heilkunde*, 1868, Heft. 6) believed that they are formed by the confluence of several white blood-corpuscles within blood-vessels. Thaon (*Recherches sur l'Anatomie pathologique de la Tuberculose*, Paris, 1873) did not believe that there are such things as giant-cells in tubercle, but that they are merely blood-vessels filled with blood-coagulum! Curiously enough this most extraordinary view was supported by MM. Cornil et Ranvier (*Manuel D'Histologie pathologique*). Wagner and Rustitsky (*Virchow's Archiv.* vol. lvi. pp. 531, 532, and lix. pp. 217,

224) supposed that they are formed from cells of different kinds, but more especially from those of the vascular wall. Brodowski (*Virchow's Archiv.* vol. lxiii. p. 113) made out that they are in some way, not clearly explained, formed by "an abnormal functional capability of the vascular walls." Lastly, Klein (*Anatomy of the Lymphatic System*, II. The Lung, p. 76) announced that they may be developed either from lymphoid cells ("displaced colourless blood-corpuscles") or from the alveolar epithelium. In the latter method of construction they may arise by the enlargement of a single epithelial cell or by the fusion of several.

There is little doubt that the giant-cells found in myeloid tumours, in ossifying bone, and in many other tissues, are all essentially of the same nature as the bodies which constitute so prominent a feature in the structure of tubercle. They have, practically speaking, the same appearance, and, when carefully studied, it will be found that they pass through similar gradations in proceeding towards the evolution of the perfect tissue which they are destined to produce.

The first step in their development in primary tubercle of the lung is that one of the large connective tissue elements which in great part constitute the young tubercle growth, such as those depicted in Fig. 19, begins to enlarge more than those around it. Sometimes the enlargement is not limited to one cell, but two, three, or more of them simultaneously increase in dimensions. There is generally, however, one of them more developed than the others. In a short time the protoplasm of this cell becomes very granular, and it then forms what would be called a small giant-cell, or a large epitheloid or endotheloid body. It rapidly assumes colossal dimensions, so that in the course of a week to ten days it may have assumed all the characters of a fully grown giant-cell. The transformations that it subsequently goes through have already been described. In certain cases an appearance is sometimes seen, as Klein has described, as if several small cells ran together to form a larger cell. Such a method of giant-cell production is, however, more apparent than real, and if the matter be carefully studied the former method of formation will, I feel assured, be found to be the true one.

THE HISTORY AND THERAPEUTICAL VALUE OF ARSENIC IN SKIN DISEASES.

BY MALCOLM MORRIS, M.R.C.S.

Joint Lecturer on Dermatology at St. Mary's Hospital Medical School.

(*Continued from page* 440, Vol. xxiii.).

Special History in Skin Diseases.

The foregoing history of the use of arsenic in general diseases, especially in intermittent fevers, shows clearly the alternate periods of belief in, and fear of it as a medicine, and must be understood to comprehend the history of its use in skin diseases. It will have been noticed that up to the time when its action was first physiologically examined, each period of excessive popularity was followed by a period of equally excessive distrust. But after the commencement of the eighteenth century, the re-actions seem, with two notable exceptions, at different times in Germany and France, to have become less and less marked, and by this time its value in general medicine, especially in fever, appears to have been justly estimated. The history of its use, and of the process by which the modern estimate of its general value has been gradually arrived at, will be of assistance to us in trying to steer between the equally excessive use and disuse of it in skin diseases, and in trying to arrive at a fair estimate of its value in this special department.

I now intend to give, first, a brief history of the use of arsenic in skin diseases, in order that we may see and avoid the extremes to which partisans on either side have been drawn; secondly, a description of the physiological action of

it as at present accepted; and thirdly, the results of personal experience. In conclusion, I hope to be able to draw some reasonable inference as to the particular class of skin diseases in which it may be prescribed.

In the history of the general use of arsenic, it was noticed that it was in common use among quacks as a remedy against ague and fever, even at the time when it was in greatest disfavour among medical men, and this was also the case as regards skin diseases. Two remarkable instances of this may be mentioned, one in Germany and one in England. Ackermann gives the prescription kept as a secret by a family of surgeons for many years, which they declared to have been most successful in the treatment of herpes. An Edinburgh *Pharmacopœia* of about 1775 gives a prescription under the name of *solutio mineralis arsenici* which was used among the people to cure leprous diseases.

Besides this popular use I have only been able to discover three distinct references to its early use by medical men. In 1784 Dr. Adair, who had practised in the West Indies, states in a communication to the *Medical Commentaries of London* that he had used it internally with opium in the form of pills in cancer, elephantiasis, and yaws. According to Desgranges, who speaks on the authority of Dr. Valentin, Rush of Philadelphia used to prescribe it for dartrous and other serious affections of the skin, seemingly without success, but also without any ill-effect. Oberreich [1] who wrote on arsenic in the year 1803, speaks in exaggerated terms of it as being the most efficacious remedy in a large variety of different diseases, including herpes and cancerous ulcers.

These individual experiences had no widespread effect, and until Dr. Thomas Girdlestone of Yarmouth contributed his well-known letter to the *Medical and Physical Journal of London*, in April, 1806, no actual case of cure by means of it had been recorded. He says, that "although I had frequently used with success the arseniate of potash in mesenteric, and many other scrofulous affections, yet your old acquaintance Mr. B. was the first patient on whom I tried the effects of this medicine in lepra. You remember that he had laboured for fourteen years under

[1] Harles, p. 114.

that disease, tried repeated salivations, many physicians and every quack medicine, without any effect, and was at last cured by small and repeated doses of arseniate of potash. It is now several years since his cure was completed, and my experiments and success have extended to some hundreds of cures of lepra, lichen, prurigo, psoriasis, tinea capitis," &c.

Another early case is reported in the *Medical and Physical Journal* of 1807, by T. Y., who gives the notes of his own case. He says: "I had had severe psoriasis diffusa since 1800, had tried every known remedy without avail, local and constitutional, when I began arsenic as recommended by Girdlestone. Began three drops twice a day, increased to seven, in six weeks I was quite well." Its use in skin diseases seems to have become known immediately, for in 1807 Dr. Bardesley of Manchester gave his experience of Fowler's solution, and in 1812, an American physician, Dr. Redman Coxe, narrated a cure of lepra of fourteen years date cured by arsenic.

Nevertheless Willan in the first edition of his great work on cutaneous diseases makes no mention of it, but it must soon have been recognised in English practice, for Biett, who was the first to use it at the celebrated Skin Hospital at St. Louis, is said by Cazenave to have introduced it from the London hospitals. Bateman in his edition of Willan, published in 1819, speaks of Fowler's solution being extremely beneficial in inert cases of lepra, owing to its tendency to support the strength, and to stimulate the cutaneous vessels.[1]

In a monograph on arsenic by Mr. John Marshall, 1817, he says that Dr. Browne, senior physician to the Sea Bathing Infirmary at Margate, gives arsenic in skin diseases, but always limits the dose to 5 ♏. of Fowler's solution, twice a day, beginning with 3 ♏., and his reason for not giving more than 5 ♏. is because of the deleterious effects he has witnessed when the drug has been pushed.

In France Fodéré used it with success in some dartrous affections, as well as in intermittent fevers, but it was not a recognised remedy in skin diseases till Biett, as has been already stated, introduced it at the Hospital of St. Louis in 1817. By the year 1820, he had invented the arseniate of ammonia, which

[1] Page 33.

he gave in addition or in alternation with the solutions of Fowler and Pearson. He seems, according to Cazenave's article on arsenic in the year 1833, to have used it not only in lepra and psoriasis, but also in eczema, impetigo, and urticaria tuberosa with success, and to have tried it, but without avail, in porrigo, acne, sycosis, and lupus. Rayer, whose first work was published in 1826, mentions arsenical preparations for chronic cases of almost every disease, but in his introduction he says that "for his own part he ardently hopes that experiments of another description, put to the same test, may cause these violent remedies to be superseded by external medicines, more rational, more immediate in their effects, and less dangerous."[1] In his later edition, translated by Dr. Willis in 1835, he says that arsenical medicines are most frequently and most successfully employed in certain chronic and obstinate forms of eczema of the scrotum, margin of the anus and labia; they ought never to be used in exanthematous, and but rarely in chronic bullous inflammations, occasionally in lichen, and sometimes in spite of much abuse, with success in prurigo, pityriasis, psoriasis, and lepra.[2] Cazenave in his article in 1833 said that marvellous effects resulted from the administration of arsenical preparations, not only in lepra and psoriasis, but also in eczema and impetigo, though they failed in porrigo, acne, and sycosis. In his *Manual* on diseases of the skin published in 1853, he repeats even more emphatically his former opinion. Devergie, Hardy, and Bazin all largely recommended arsenic, the two latter chiefly in dartrous affections.

In Germany the use of arsenic has not been so extensive as in France and England, for Hebra, the distinguished dermatologist of Vienna, has, since 1840, taught rather the value of external instead of internal remedies, and the necessity of placing the latter on some scientific basis. He says: "I set not the slightest value on any remedies except those which (after repeated trials, and when I am accurately acquainted with the complaint) I find to produce a favourable change in its course, or, in other words, to cure the patient. I never attribute therapeutical powers to a medicine, unless I observe its employment to be invariably and constantly followed by some change in the

[1] *Traite de Maladies de la Peau*, Paris, 1826. [2] Page 85.

morbid products, and by the termination of a disease in a shorter time than when it is allowed to undergo spontaneous involution."[1] Yet he gives it in psoriasis, remarking that arsenic has a decided curative action, and can make this affection undergo involution for a time, if not permanently, and also in lichen ruber with good results. On the contrary, he denies its value in eczema, and says, in strong language: "I cannot concede to arsenic the undefined blood purifying and eczema curing powers, which are attributed to it by English and French physicians."[2] Neumann and the other German writers adopt pretty nearly Hebra's views.

Though the science of dermatology had taken deep root in France in the early part of the century, chiefly, or I might say entirely, due to the labours of the St. Louis physicians, yet it had not done so in this country; for, after the death of Bateman, who carried on Willan's great work, nothing of any importance was published on the subject till 1842, when Mr. Erasmus Wilson's work on diseases of the skin appeared. In this early edition, not very much mention is made of arsenic; under the head of eczema, it is included among several other remedies as a suitable one for the chronic and obstinate forms. Its action is described in a footnote in the following words: "Arsenic, when it acts on the nervous system, performs the part of an alterative, but when its effects are directed upon the digestive system, it appears to act like cantharides upon the mucous membrane of the kidney, viz., by counter irritation, by exciting inflammatory action in the interior, and thus determining from the surface."[3] In lepra also Mr. Wilson had used it, but he does not strongly urge its adoption, as its action is only incidentally mentioned in a footnote. In his lectures delivered before the Royal College of Surgeons in 1871-2-3, Mr. Wilson points out that in eczema there is no medicine more harmless, more certain in its effect, and more successful than arsenic. The good qualities as well as the dangerous effects are again referred to when dealing with lepra, but it will be sufficient for me to say that Mr. Wilson strongly advocates its use in this disease.

No Englishman, and probably no man who ever lived, used

[1] *Hebra on Diseases of the Skin. New Sydenham Society Trans.* Vol ii. p. 89.
[2] *Ibid.* Vol. ii. page 143.
[3] Page 172.

arsenic to such an extent as Hunt. He not only gave it in every single disease of the skin, but states in the ninth edition of his book, published in 1871, that it is a perfectly harmless drug, and that after thirty years' observation he has rarely known it produce any unpleasant effects on the system in a degree incompatible with perseverance in its use. He adds. "There are few medicines less likely to do harm than arsenic."[1] Modern English dermatologists do not however go to the excesses of Hunt. Dr. McCall Anderson[2] recommends it both in eczema and psoriasis, and Dr. Tilbury Fox in cases of the latter in which "the scaliness is well-marked, and the disease in other respects typical."[3] Mention must also be made of Dr. Bulkley, the eminent American dermatologist, who in his monograph *On the use and value of arsenic in the treatment of diseases of the skin*, has given a clear and practical summary of his experience with it.

Physiological Effect.

From this short history, it will be seen how much the internal use of arsenic has been regulated by more or less empiricism; how that its success in one disease has caused it to be tried in all; and how its known poisonous property has often caused its therapeutical value to be denied. But more recent observers have investigated its physiological effect on the various organs of the body, and it will now be my endeavour to consider their results.

The fortunate absence of ill results even when taken in large and increasing doses is clearly seen in the arsenic-eaters of Styria. In the year 1851 Tschudi first drew the attention of the profession to the existence of this habit, the objects for which it was taken, and the result. It seems that the young peasants, both men and women, take it to improve their personal appearance, and also, according to Wurmb, to make their respirations deeper and easier. To all appearance they achieve their object and apparently meet with no inconvenience even when they are

[1] *Guide to the Treatment of Diseases of the Skin*, 1871, 9th Ed. p. 18.

[2] *A Practical Treatise on Eczema*, London, 3rd Ed. 1874; *On Psoriasis and Lepra*, London, 1865.

[3] *Skin Diseases*, London, 3rd Ed. 1873, p. 268.

taking large doses, unless they suddenly stop using it, which causes sickness, burning pains in the stomach and other symptoms of poisoning very speedily followed by death. Tschudi was opposed, especially in England, where Taylor, Pereira, and Christison openly stated their disbelief, but his assertions have since been verified by many German physicians, and by Dr. Craig Maclagan of Edinburgh. From the analogy of its effects on man it is not an uncommon custom for coachmen, especially in Vienna, to give it to their horses to make their coats more glossy and to fatten them.

Before discussing the effects of arsenic on the various parts of the system it will be well to draw a distinction between the effects of poisonous and therapeutic doses, since it is owing to the want of such distinction that such opposite conclusions have been arrived at as to its physiological properties.

In this paper it is proposed to examine only the effects of small and therapeutical doses.

M. Lolliot, in his extremely able physiological study on arsenic, discusses, first, its action on nutrition, respiration, circulation, and the nervous system; and secondly, its elimination by the skin, the mucous membranes, and the liver and kidneys. This arrangement seems to be exhaustive, and will here be followed.

1. *Nutrition.*—The increase of appetite caused by arsenic is so noticeable as to have drawn the attention of the earliest investigators, and Harles attributed it to an increase of irritability of stomach and intestines. Biett and Cazenave noticed the fact and believed it was due to the same cause, as did Dr. George Harley, who, amongst his deductions from experiments on animals, states that arsenic has "a specific action on the digestive canal."[1] But certain German investigators, Schmidt, Sturzwage, and Brett-Schneider, proved by experiment that arsenic had a direct action on nutrition by diminishing oxidation, and these results were confirmed by Claude Bernard and by Professor Sée. The former, after explaining the action of carbonic oxide on the coloured corpuscles of the blood, says that arsenic acts in a similar manner. "It fixes," he writes, "upon the blood corpuscles, but does not entirely suppress their action; it

[1] *Times and Gazette*, Nov. 1861.

only tends to diminish the activity of the perpetual exchange carried on by their means between O and CO_2, a state of things which, when confined within proper limits, is not wholly incompatible with health, and under such circumstances produces, as a natural result, a certain degree of obesity."[1] Arsenic, therefore, in consequence of this combination with the coloured corpuscles, prevents them from receiving the due amount of O in the lungs, and therefore diminishes oxidation in the tissues and prevents wasting. Its final action on nutrition in the decrease of the temperature and diminution of the urea is due to its action on the digestive organs.

2. *Respiration.*—I have mentioned the improvement in respiration noticed in the Styrian arsenic-eaters, and it is an acknowledged effect produced by it as shown in the diminished oxidation in the tissues. Lolliot attributes this to the diminution of the quantity of CO_2 exhaled and consequent great freedom of the respiratory movements. It is now acknowledged that muscular fatigue is shown by an increase of CO_2, and therefore when CO_2 is decreased, muscular action is proportionally made easier. But it must also be remembered that the less O there is in the blood, the greater is the stimulation of the respiratory centre, and as a direct result breathing is improved.

3. *Circulation.*—The bright colour observed in arsenic-eaters has been attributed to a paralysis of the vaso-motor nerves, thus permitting a greater flow of blood. After the injection of arsenic into a vein, a marked fall of general blood-pressure has been noticed by Unterberger. Arsenic, at least in small doses, has but little effect on the heart, though Fowler and some other observers have stated that it increases the beats of the heart. Cazenave and others deny this, and say that arsenic only acts on the heart in poisonous doses.

4. *On the Nervous System.*—The action on the nervous system is very obscure, but there can be no doubt that in small doses it may produce headache, and in larger and prolonged doses some symptoms of paralysis. This seems to indicate that the central nervous organ is implicated and most probably through the influence arsenic exerts on the blood.

Elimination.—Having described the direct physiological effects

[1] *Times and Gazette*, May, 1860.

of arsenic on the system, its various modes of elimination must now be mentioned. It is eliminated by the skin, the mucous membranes, the liver and the kidneys. That it is eliminated by the liver and kidneys has been proved by its discovery in the bile and urine. The various phenomena, such as conjunctivitis, bronchitis and diarrhœa, &c., after its use, prove as conclusively its elimination by the mucous membranes.

Its elimination by the skin is for our purpose of more importance, and will be discussed at greater length. It has been found both in the serum of a blister by M. Chatin and in the sweat of patients undergoing arsenical treatment for psoriasis at St. Louis by MM. Bergeron and Lemattre by means of Marsh's test. Besides these direct proofs we must now proceed to notice the physiological effects of its elimination by the skin when given in small doses. It has been observed by Christison and others that an increase of perspiration followed by violent itching and sometimes by eruptions, soon affect those who have taken arsenic. The itching may occur over the whole body or on particular parts, such as the hands, feet, and face, but is only temporary unless there is an eruption. M. Imbert Goubeyre has written a monograph on arsenical eruptions, dividing them into papular, vesicular, &c., but this seems an exaggerated account, for such eruptions are of rare occurrence. Nevertheless, though positive eruptions are rare, brown staining of the skin is often observed. It has been said that these stains generally appear after psoriasis, but they are probably more common then, rather because the arsenical treatment has been prolonged than for any peculiarity in the disease. Boils and carbuncles also occasionally result, and as they originate in the deeper portion of the corium, they are a further proof of the passage of arsenic though the skin itself. Before leaving the subject of elimination, I must mention the important experiments on arsenic by Drs. Ringer and Murrell, published in the *Physiological Journal.* They found that when frogs were poisoned by arsenious acid in a certain number of hours desquamation of the epidermis was produced. Further experiments were made by Miss Nunn, who states that "the general effect of arsenious acid on the epidermis is to cause a degeneration and partial solution of the protoplasm of the cells, whereby (1) the whole

epiderm becomes loosened from the subjacent derm (2), the cells of the malpighian layer become incoherent, so that the whole layer collapses and its well known architectural features become obscured, and (3) the intermediate layer separates from the malpighian layer below and at times from the corneous layer above."[1]

THERAPEUTICAL EFFECT.

Having considered the physiological action of arsenic on the system, and the modes by which it is eliminated, especially by the skin, I shall now pass to the more practical part of my paper and mention the various diseases of the skin in which it is recommended, and the results of my own experience.

Psoriasis is the disease of all others that arsenic has been prescribed for, from the time that Girdlestone gave it first up to our own day. It must be acknowledged that it would be absurd to doubt the curative effects of arsenic in this disease, for all writers on dermatology agree in praising it, but at the same time there are cases in which not only arsenic does no good, but really does great harm. Why this is the case it is difficult to explain. It seems as if the drug in these cases acted more on the vessels themselves through the medium of the vaso-motor nerves than on the blood. The following case is an illustration:—

CASE I. H. M., a female, aged 34, who appeared in good health, applied at St. Mary's Hospital on July 3rd, 1879. She had several well-marked patches of common psoriasis both on her arms and legs, also a few on the trunk. This was the fourth attack. The patches were not markedly hyperæmic, but there was an abundant formation of scales. She was ordered 4 ♏. of Fowler's solution in water, three times daily, and no local application.

July 10th.—A few fresh patches have appeared during the week; the old patches about the same. Ordered not to wash, but to continue the medicine for fourteen days.

July 24th.—The patches were much worse, more intensely hyperæmic and very painful. She was then ordered local applications and the arsenic was discontinued.

In this case arsenic was fairly tried alone and undoubtedly did harm. I could mention other cases that have come under

[1] Vol i., 1878-9, page 248.

my observation in which a similiar result took place, but it is sufficient to have noticed the fact.

In order that we may judge honestly whether arsenic really can be said to cure psoriasis, it must be given alone, without combination with any other drug. This, I think, is very important, as arsenic is often given with iron, and when a cure is effected it is difficult to know which drug is to be credited with the success. Another point is the local treatment, for every one will admit that local applications alone will, if carried out properly and persevered in long enough, entirely remove all external traces of the disease. But can this be called a cure? My answer is, certainly not; for psoriasis usually relapses, and unless we prevent this occurring we cannot say the disease is cured. I have given arsenic by itself to a certain number of patients without any local application, and have carefully watched the effect in order that I might ascertain whether by preventing the formation of new patches and modifying the older ones, some idea might not be arrived at why, by its long continued use, relapses are prevented.

CASE II. E. F., aged 23, applied at St. Mary's Hospital on August 14th, 1878, with psoriasis of the whole body. At my request her blood corpuscles were counted by my friend Dr. Henderson, by means of Dr. Gowers' instrument. The coloured corpuscles numbered 58 per square. She was ordered Fowler's solution ♏. v. and no local application.

August 21st.—Corpuscles 48 per square; eruption somewhat better.

August 28th.—Corpuscles 37·1 per square; eruption fading.

September 11th.—Corpuscles 37·3; eruption almost disappeared.

CASE III. J. E., aged 13, applied on the same day with general psoriasis. Corpuscles 48·4 per square.

August 21st.—Corpuscles 42 per square: eruption much better.

September 11th.—Corpuscles 45·25 per square; rash much worse; did not attend last week; has taken no medicine.

September 26th.—Corpuscles 40 per square; has taken medicine regularly since last visit; eruption nearly well.

These two cases were not selected for any special reason, except that they happened to come on the same day. It will be noticed that the improvement in the eruption coincided with

a diminution in the number of coloured corpuscles, unaccompanied by increase or diminution of leucocytes. The second patient, J. E., having omitted to take her medicine, an aggravation of the eruption was found to coincide with an increased number of coloured corpuscles. In another case, L., a young girl, aged 13, the improvement coincided with a diminution of corpuscles from 51 to 46. She was not however long enough under observation subsequently to say whether the diminution would have continued.

These observations at first sight appeared to be opposed to the results of Dr. Gowers' experiments, for he found that arsenic like iron increased the corpuscles.[1] This is undoubtedly so in anæmia when first given, but if continued for any length of time, or administered in health, it has been proved by Drs. Cutler and Bradford that the number of both coloured and white corpuscles are diminished. We have seen that in large doses arsenic acts on the lower cells of the rete as a protoplasmic poison, and it seems to me therefore that it can fairly be argued that small doses in a much less degree may have a similar effect in preventing the growth of the upper layers. Whether this action on the rete is brought about in consequence of the corpuscles being fewer in number, or because of the part arsenic takes in retarding oxidation, it is difficult to say, but I am inclined to suggest the theory that it is in one or both of these ways that arsenic acts beneficially in psoriasis. I have seen two cases of psoriasis rapidly cured by sudden but accidental loss of blood, and this was the common mode of treatment by the earlier physicians. Indeed, Hunt himself, who believed so exclusively in arsenic, always bled in severe cases, and says the eruption faded accordingly. Psoriasis usually attacks people who are in good health, and very often of a plethoric habit. From these remarks it would seem as if I thought that arsenic was a depressant; I would rather say that it is an economiser. I agree with M. Gubler when he says that "arsenic is a contra-stimulant, and antipyretic, but not a tonic; it is opposed to waste, but creates no strength. In preventing the organism from rapidly wasting away, it permits the reconstruction and storing up of fat, whence the appearance of health."

[1] *Practitioner*, July, 1878.

After the acute attack of psoriasis has disappeared, I should recommend that arsenic be given in very small doses, but to be continued for a long period. I feel justified in giving this opinion from several cases I have seen, one of which I give the brief notes.

CASE IV. Mrs. W. consulted me in June, 1878, for a severe attack of psoriasis. She was 40 years of age, and had had the disease since she was 12, with only short intervals free from the eruption. The extremities were particularly affected, especially the fronts of both knees. I gave her 5 ♏. of Fowler twice a day, and an ointment of chrysophanic acid. After about three weeks of this treatment, the eruption had nearly disappeared. I then gave her 2 ♏. of Fowler twice a day, and this she has been taking with hardly an interval since that time till January of this year. During this long period she has not had any relapse, and I cannot but believe this is due to the long course of arsenic she has had.

A noticeable point in this case is, that throughout this course there were no constitutional effects, and for my own part, I do not agree with Hunt, who says that to do any good arsenic must be pushed till "a pricking sensation is felt in the tarsi and the conjunctiva becomes inflamed; at this crisis the disease is brought under arrest;" though in this view he is supported by Dr. Begbie in an article in the *Edinburgh Medical Journal*, 1858.

My conclusions are (1) that arsenic sometimes relieves psoriasis in an acute state, sometimes aggravates it; but what are the exact indications for its use, it is in our present knowledge of the etiology of the disease, impossible to say; (2) that arsenic should always be given in small doses for a long period after the eruption has disappeared, to prevent a relapse; (3) that it is never necessary during this course to increase the dose, so as to produce any physiological effect, such as irritation of the eyes.

I now pass to the consideration of another disease which in many of its characteristics is closely allied to psoriasis; I refer to lichen planus. There is some doubt, I know, in this country whether the lichen planus of Erasmus Wilson is the same disease as the lichen ruber of Hebra. The present is not the opportunity for discussing this question, but nevertheless it

is important to remember that Hebra in a note to the English translation of his work mentions seven cases of the disease cured by arsenic. I have seen arsenic prescribed with apparently good results in this disease at the Skin Hospital Blackfriars, but I must admit with the addition of the local application of tar, so that it was doubtful whether the arsenic or the tar did the most good. But a case under my own care is of interest, as no local applications were used.

Case V. Mrs. G., a lady in fair health, aged about 50, consulted me last summer. The eruption which was situated on the inner side of the thighs and the outer sides of the fore-arms, consisted of flat-topped papules of a violet colour and slightly scaly. Some of the papules were close together, others scattered. The itching was very severe. I gave her 8 ♏. of the Liq. Sodæ Arseniatis after food, twice a day, for a week, then three times a day. After regularly taking the arsenic in this form for one month the eruption began to fade. She still persevered with the medicine for another month, when hardly any trace of the papules was left beyond slight pigmentation. Since that time she has taken occasionally for a period of two or three weeks 4 ♏. of the same solution, twice a day, and has had no relapse.

Another case came under my notice in the summer of 1878. A young man, aged 22, a shampooer in a Turkish Bath had lichen planus on his thighs and buttocks. Though he believed that the bath had the power to cure any or all diseases of the skin, yet he admitted that he had suffered from his for many months. Under the influence of arsenic in the form of Fowler's solution in 5 ♏. doses, three times a day, he was entirely cured in a little more than a month. In lichen planus therefore my own conviction is, that arsenic is an invaluable remedy, since in the cases I have tried it I have never seen it fail.

In the acute varieties of eczema arsenic is by all admitted to be injurious, but in some of the chronic forms it is recommended by authors. I have never yet ordered it alone in chronic eczema, probably because I have always felt it would be unjustifiable to abstain from using local treatment at the same time. Under these circumstances it is impossible to speak with any degree of accuracy concerning its action. I must confess I doubt whether arsenic produces any specific effect in

this disease, for I have noticed that when the local remedies are used with less energy, even though the medicine be taken regularly, the eruption is sure to be worse.

The value of arsenic in pemphigus has been more recently established, and, in consequence of Mr. Hutchinson's advocacy, it is now a generally recognised remedy in this disease.

In the *Medical Times and Gazette* of February 11th, 1854, cases under the care of the late Mr. Startin are reported, twelve of which were improved by arsenic, though they were not all cured. In the same journal for March 2nd, 1861, seven cases cured by arsenic are mentioned by Mr. Hutchinson; also another case in March, 1872. But it was as late as October, 1875, that Mr. Hutchinson's clinical lecture, entitled, "Can Arsenic Cure Pemphigus?" appeared. In this lecture he gives the notes of twenty-six cases, all of which were successfully treated by arsenic. Several other English observers have had similar experiences, but on the other side it must be said that Hebra in Germany and Tilbury Fox in England do not believe in it as a specific. The latter says at the end of a clinical lecture on pemphigus, "there is no specific for pemphigus. Arsenic is declared to be one, but it often signally fails to cure the disease, and I have seen quinine, in full doses, do much more good." I have myself lately had the opportunity of seeing a case under the care of Dr. Handfield Jones at St. Mary's Hospital, in which arsenic certainly did harm, and which was ultimately cured by quinine. On the other hand, I have seen cases in which the curative action of arsenic was undeniable. I recently read the notes of two such cases before the Harveian Society and I briefly recapitulate them:

CASE VI. Mrs. S., a married lady, aged 42, first noticed the appearance of bullæ on the abdomen in the August of last year, when she was six months pregnant, and a short time later a few appeared on the right wrist. She was confined on December 12th, and immediately fresh outbreaks of bullæ appeared. I saw her on December 20th in consultation with Mr. Robert Walker of Maida Vale, when I found the eruption situated on both arms and legs and over the body. The bullæ were arranged symmetrically in marked lines along the course of the cutaneous nerves. We ordered her 10 ♏. of Pearson's solution together

with 10 ♏. of tincture of iron, to be taken three times a day. After taking this for a month all traces of the disease disappeared, and it has not since relapsed.

CASE VII. A. L., aged 6, ♏. came to St. Mary's Hospital in August, 1878. Has had constant attacks of pemphigus since the age of three. She had several times been ordered arsenic, but had not persevered regularly with it. Ordered 3 ♏. of Fowler with ½ ʒ. of Vinum Ferri, twice a day. This she took till the attack subsided, but she constantly returned to the hospital in consequence of fresh outbreaks. In July, 1879, I gave her the arsenic without the iron in 3 ♏. doses, three times a day. When given alone it seemed to have a more rapid influence on the disease, and since last September she has not had a single relapse.

How arsenic acts in pemphigus is difficult to say. Whether it is through its effects on the blood or by its direct influence on the nervous system, I do not venture to offer a theory. I will now briefly mention one or two other diseases of the skin in which arsenic appears to act with benefit.

Chronic urticaria when unattended by an intestinal irritation is greatly relieved and often cured by a course of arsenic. Though an attack of zoster is not cut short by it, yet the severe pain in the course of the nerve which often lasts a long time after the eruption has disappeared, especially in elderly people, is greatly modified. This is mentioned by Trousseau in his *Clinical Medicine.*

Acne may be benefited by arsenic, but I have no evidence myself to offer on the subject. Dr. Bulkley says, "Of the value of arsenic in certain forms of acne, or rather in certain cases, I can speak with considerable positiveness."[1]

Since arsenic has been found to be effectual in such different diseases as psoriasis, pemphigus, and urticaria, I cannot but think with Mr. Hutchinson that they must have some common cause, in spite of the variety of their external manifestations. Whether arsenic acts upon them all equally through the blood, or on the nervous system through the blood, or by some peculiar action on the epidermic cells themselves, cannot be positively determined with our present knowledge.

[1] *The Use and Value of Arsenic in Diseases of the Skin.* New York, 1876, p. 23.

In conclusion, let me remind you that though arsenic is a valuable remedy in some, it is by no means a universal cure in all, skin diseases; but at the same time there need be no necessity for fear of ill results if the drug be given in moderate doses. It must also be borne in mind that some individuals have an intolerance for arsenic, under which circumstances I should advise that the various preparations be tried before the drug is abandoned; that it should *never* be combined with any other drug, even iron; that it should always be taken during or after food; that it should never be pushed to produce the slightest constitutional symptom; and that it should be continued to prevent relapses for a great length of time after all traces of the disease have disappeared.

I am indebted to Dr. Cheadle of St. Mary's Hospital for his kindness in allowing me to publish the notes of the cases that were treated in his clinique.

CITRATE OF CAFFEIN AS A DIURETIC.

BY D. J. LEECH, M.D., M.R.C.P.,

Physician to the Manchester Infirmary.

(*Continued from page* 412.)

In three cases of abdominal dropsy of obscure origin, but probably dependent on chronic peritoneal changes I have had evidence of the diuretic effect of caffein.

Case XVIII. A. D., aged 60, was admitted into the Chorlton Union Workhouse in October, 1879, with a history of abdominal pain, commencing some few months before admission, and followed by dropsy. She was much emaciated; the abdomen contained a considerable quantity of fluid and measured thirty-six inches. No physical evidence of disease of any of the organs could be obtained. When I first saw her, she had been in bed several days, passing but little water, and not decreasing in size. Mr. Orchard, the Resident Medical Officer, very kindly offered to administer citrate of caffein and keep a record of its effect on the woman.

I am indebted to him for the following table:

	Ounces	
Oct. 18	20	(Girth 36 in.)
19	30	
20	35	Caffein Citrat. gr. iij. tertiis horis.
21	30	
22	40	
23	43	(Salivated.)
24	32	
25	40	
26	42	(Girth 33 in.)
27	20	No medicine.
28	30	
29	33	

		Ounces	
	30	63	
	31	53	Caffein Citrat. gr. iij. tertiis horis.
Nov	1	35	(Salivated)
	2	40	(Girth 32¾ in.)
	3	20	
	4	45	
	5	35	
	6	20	No medicine.
	7	25	
	8	26	
	9	35	
	10	52	(Girth 32 in.)
	11	45	(Salivated.)
	12	55	
	13	55	
	14	32	Caffein Citrat. gr. iij. tertiis horis.
	15	35	
	16	35	
	17	40	
	18	40	(Girth 30 in.)
	19	35	
	20	25	No medicine.
	21	35	
	22	25	

In this case profuse salivation always followed the administration of the caffein; no fœtor accompanied the flow of saliva, which amounted to from twenty to 50 ounces in the twenty-four hours. The salivation always ceased within twenty-four hours after the caffein was discontinued. The drug produced no headache or sickness. The fluid entirely disappeared from the abdominal cavity and she appeared to be cured. She died some months after, apparently from an acute attack of peritonitis.

Case XIX. E. E. was under my care in the Manchester Infirmary in the latter part of 1879. She suffered from ascites, which followed on prolonged abdominal pain. From the patient's account of herself, it would seem that fluid had been present in the abdominal cavity some eighteen months before admission. Four times during the past nine months she had been tapped, and from twelve to twenty-eight pints of fluid removed, but on each occasion the fluid had returned in a few weeks. The last tapping had been performed three weeks before admission. After trying copaiba and other diuretics, I gave citrate of caffein in three-grain doses every three hours. When she had taken it two days, she felt sickly, and I suspended its use for a week. The urine only increased slightly in amount, but profuse diuresis immediately occurred when I commenced

again to administer the medicine, and the ascites quickly disappeared. Four months later I saw her in good health. Neither nausea nor headache was produced the second time the medicine was administered.

I am unable to append the urine table, which was accurately kept, but has been mislaid.

Case XX. S. H., aged 13, came into hospital on the 6th of October, 1879, with bronchitis, enlarged liver, ascites, and œdema of the legs. Her features were livid, and the veins of the chest, abdomen, and neck were unduly large. The cause of the ascites could not be determined, and though later on indications of effusion into the left pleural cavity and of tumour in the anterior mediastinum, appeared, the exact nature of the primary lesion was by no means clear.

At her death, which occurred suddenly on the 25th of April, 1880, a mass of caseous material on the right side of the anterior mediastinum was found, whilst on the left side, in a corresponding position, were several enlarged glands. The caseous mass had pressed on the superior vena cava, and likewise on the right auricle and the orifice of the inferior vena cava. The liver presented the ordinary appearance of chronic passive congestion. After the fluid had been removed from the abdominal cavity, the peritoneum was found thick and sodden, and in one or two places scattered tubercles were seen.

Copaiba, juniper, caffein, and digitalis were tried in turn. The first seemed to increase the quantity of urine slightly, but it caused sickness; the other three drugs appeared to have no effect. The caffein was given in one and then in two-grain doses every three hours. The accuracy of the urine record was vitiated by the carelessness of one of the nurses, whose duty it was to see that the urine was duly collected, and on this account the urine table during the greater part of the patient's residence in the hospital is not given. She was twice tapped, the last time on the 27th of March; and subsequently caffein was again given in three-grain doses. From the 8th of April the urine was correctly collected and measured, and the following table seems to show that the caffein influenced the urinary excretion:

	Ounces.	
April 8	20	
9	16	Potassæ Citr. gr. x. ter. in die.
10	17	
11	43	24 grains of Citrate of Caffein given.
12	33	18 grains given.
13	22	12 grains given.
14	23	
15	16	
16	21	
17	9	No medicine.
18	10	
19	16	
20	23	12 grains of Caffein given
21	22	9 grains given.
22	18	
23	11	No medicine.
24	20	

In two-grain doses the drug caused headache after it had been given three times daily during a week. For the reason above stated, it is impossible to say that no diuretic effect followed. Yet the increase in urinary excretion, if any, could not have been great. When caffein was ordered in three-grain doses every three hours, the urine increased greatly in quantity, but the headache, sickness, and palpitation followed the exhibition of the drug in these doses so quickly that the full quantity could not be given, and hence the variation in the daily amount administered. A cessation of the caffein for a few hours always caused the troublesome symptoms to disappear. Another attempt to administer the drug on the 21st and 22nd of April was followed by similar results, sickness, headache, and palpitation following when two or three doses had been given. Save for the temporary troubles caused by caffein, the girl had steadily improved in health after the second tapping. No increase of fluid in the abdominal cavity had taken place for some days when she was suddenly seized with an attack of convulsions whilst walking in the Infirmary grounds. She died a few hours afterwards in a second attack. At the post-mortem the kidneys were found somewhat congested, but otherwise healthy.

My experience of the action of caffein leads me to believe that in many cases of œdema and ascites from various causes it will set up a diuresis when potent drugs of its class have quite failed to act upon the kidneys, though at times of course it

will fail where other diuretics succeed; but it has certain properties which limit its utility.

The diuretic effects of caffein seem to depend in part on the influence which it exercises on the general circulation, in part on a specific action which it has on the kidneys. Unlike digitalis, it has little, if any, influence on the vagus, but it resembles digitalis in directly stimulating the heart and increasing the blood pressure. It probably augments the vascular tension too, by causing contraction of the small arteries. But the action of caffein in increasing the blood pressure depends on the dose in which it is given, and hence varying opinions have been held as to its effects on the blood pressure. Most observers have come to the same conclusion as Dr. Hughes Bennett, that caffein increases the frequency of the heart's beat and its force; but in 1872 Aubert recorded in *Pflüger's Archiv* some experiments which led him to believe that caffein does not increase, but decreases, blood pressure. He injected the drug into the jugular veins of many animals, and always found the blood pressure sink. Binz has, however, again carefully investigated the effects of caffein on the circulation, and published his results in the *Archiv für experimentele Pathologie und Pharmakologie* for June, 1878. He finds that moderate doses, when injected subcutaneously, always increase the blood pressure, as well as the frequency of the pulse, and points out that Aubert's opposite results were due to the large doses of caffein which he employed, and to the injection of the drug into the jugular vein, whereby its full influences was at once expended on the heart.

A large dose of caffein may lessen blood pressure, and thus tend to reduce rather than increase the urine flow. I think I have met with one or two instances in which from this cause the good results anticipated from caffein have failed to appear. Too small a dose equally fails in promoting diuresis, since it does not stimulate sufficiently the circulation. In Case IV. it will be noticed that nine grains of caffein daily seemed inert, whilst twenty grains acted powerfully, and in Case XX. the different effect produced on the urine secretion by a change in the amount given is also seen.

Caffein, then, may fail either from the smallness or the largeness of the dose.

The condition of the heart-walls, the extent to which they are weakened by advancing disease, bears of course in an important manner on the results obtained from caffein. Time after time in cardiac dropsy the heart and kidneys may answer to the whip, and the patient be restored to comparative health; but especially under unfavourable circumstances deterioration of the tissues goes on and at length the whip fails. In my first case, pericarditis with effusion, which appeared during the sixth week of the man's stay in hospital, may, by its effect on the tissues, have tended to prevent the favourable result which appeared on the administration of the caffein at first. Often, however, no special cause can be found for the advancing changes which are only in accordance with the natural history of the disease. In Case VI. the man's heart seems to have been so far weakened on admission that no stimulation could raise its failing power.

Caffein not only acts, like digitalis, as a vascular diuretic, but also specially stimulates the kidneys. The nature of this special action is of course obscure. Gubler compares it to the action of certain drugs on the salivary glands, whereby the flow of saliva is greatly increased. We may suppose that these drugs act on the salivary glands just as stimulation of the peripheral end of the divided chorda tympani nerve acts on the submaxillary gland, that is, by increasing the vascularity of the gland through the special vaso-motor centre presiding over the local circulation, the activity of the secreting tissue being increased at the same time, though, to a certain extent, independently. If caffein act in a similar manner on the kidneys, the causes of its frequent success and occasional failure become clearer. A failing general circulation, which cannot be sufficiently stimulated, may prevent that vascular excitation of the organ which is essential to increased secretion; and tissue changes in the kidney itself, or circumstances which affect the innervation of the kidney, may likewise prevent the special local effect of the drug being exercised. The tissue changes, for example, in chronic Bright's disease may

usually render impossible the local action which leads to diuresis, though at times the structure of the kidney may be less interfered with, and the drug may excite its wonted local effect and diuretic influence. In my hands, citrate of caffein has failed to induce diuresis in chronic Bright's disease, but Professor Botkin of St. Petersburg records in *Virchows Archiv* an instance of its successful administration. The chronic congestion sequential to heart disease certainly does not seem to prevent the action of caffein.

My experience of caffein in ascites from liver cirrhosis and chronic peritonitis is too small to enable me to say that it usually fails in the one, and is useful in the other, but should a real difference be found to exist between its efficacy in the two classes of cases, the connection between the innervation of the kidney and that of the liver might explain it.

The success of caffein as a diuretic is interfered with by two other causes. One is the readiness with which the system gets accustomed to caffein, which then, like opium, ceases to have its accustomed effects; the other is the variability of the action of caffein on different organs dependent on individual peculiarities.

To the readiness with which our organs get accustomed to caffein, we probably owe our immunity from troubles which might otherwise follow our large consumption of the infusion of the roasted bean. In most cases tolerance is established in both man and animals very quickly. Bintz found in his experiments on dogs with caffein that he could not use the same animals many times, because they so soon became habituated to the drug, which then ceased to produce its characteristic results.

It seems quite possible that some instances of the failure of caffein as a diuretic may be due to the tolerance of caffein which long and abundant potations of the infusion have brought about; and the instances of the subsequent failure of caffein after it had acted at first well may, at least in part, be attributed to the tolerance established.

Most drugs are found to act differently in different individuals, but caffein is specially variable in its effects. In the majority of people, it acts on the circulation generally, and in very many it causes headache. Sometimes it causes sickness, sometimes diarrhœa. Not unfrequently diuresis follows its

ingestion, rarely salivation; and it may produce any of these effects singly, or several at the same time. At times, too, it seems to affect no organ—at least in ordinary doses. It will be remembered that coffee infusion resembles caffein in this variability of its action. Most feel no result from it, but a cup of coffee will in some cause sleeplessness, in others diarrhœa, whilst diuresis is not an uncommon result, and even salivation has been produced by free coffee drinking, as in a case mentioned by Fonssigrives.

Case XVIII. (A. D.) is a somewhat remarkable instance in which citrate of caffein caused both free salivation and diuresis as well. Leven and Stuhlmann and Falk have noticed the occasional production of salivation, and Bennett saw the result several times in the course of his experiments on cats with thein and caffein. Bennett noticed some redness of the mouth in the animals thus salivated, but in A. D. this was not present.

It doubtless sometimes happens that caffein, whilst affecting other organs, is without influence over the kidneys, which under ordinary circumstances it stimulates, and in such cases of course its good effects in dropsy are in vain looked for from it.

The advantages of caffein as a diuretic are as follows. It can be readily administered in pill, or mixture, or in a cup of coffee. It is a tonic and stimulant diuretic, not depressant. It acts quickly; if not effectual in the first twenty-four hours, it rarely acts at all, unless the dose be increased. It may be given safely. When the limits of the full dose have been reached, warning in the shape of headache or sickness is usually given, and these symptoms pass off at once on withholding the drug.

On the other hand, its administration presents a few disadvantages. It sometimes readily causes sickness and headache, which may, if the dose given be large, produce considerable discomfort. I have known troublesome palpitation induced when large doses have been persevered with; rarely palpitation is brought on by doses too small to cause diuresis. Its effects are less continuous than that of some other drugs: often the effect on the kidneys ceases the day after the caffein is stopped; seldom does it last more than a couple of days.

Caffein will at times cause diuresis and amendment where digitalis fails. Some of the cases mentioned by Dr. Shapter

and the first two on my list illustrate this. But digitalis is sometimes the more powerful agent for good, especially when the circulation is extremely weak and the anasarca is not excessive. It may be that digitalis is the more powerful cardiac stimulant. Certainly its effect on the vagus should make it more influential as a regulator of the heart, though caffein does not seem wanting in some power in this respect, as shown by Case IV.

The following case, which came under my notice after the first part of this paper appeared, illustrates well the more powerful effect of digitalis in a weak-walled heart.

H. S., aged 46, came into the Manchester Infirmary on the 29th of March, 1880, with orthopnœa, ascites, and œdema, dependent on cardiac disease, which seemed to have resulted from an attack of rheumatic fever six months previously.

The heart's action was extremely irregular, a systolic murmur could be heard at the apex, but its character and conduction seemed to indicate that the mitral valve was narrowed as well as incompetent. She suffered from bronchitis, for which, during a fortnight, she took ammonia and senega.

It will be seen from the following table that caffein caused an increase in the quantity of water passed, which fell, however, at once when it was withdrawn; but that, when a week afterwards digitalis was given, the urine rose in quantity, slightly on the first two days, and very greatly on the third day, and that the diuresis continued as long as the digitalis was administered.

	Ounces.	
March 31	12	
April 1	14	
2	10	
3	14	
4	16	
5	22	
6	22	Spt. Amm. Ar. ♏ xv. Decoct. Senegæ, ℥j. ter. in die.
7	18	
8	19	
9	18	
10	18	
11	12	
12	23	
13	15	
14	36	
15	36	Caffein Citrat. gr. iij. tertiis horis.
16	42	

	Ounces	
April 17	17	No medicine.
18	18	
19	19	
20	12	
21	16	
22	17	
23	18	
24	26	Tr. Digitalis, ♏ xv. quartis horis.
25	31	
26	69	
27	104	
28	76	Tr. Digitalis, ♏ viiss. quartis horis.
29	66	
30	76	
May 1	67	
2	50	Spt. Amm. Ar. ♏ xx. / Tr. Sumbul. ♏ xv. } ter. in die.
3	56	
4	30	
5	52	
6	38	
7	44	
8	26	
9	30	

The citrate of caffein in this case caused headache and sickness, but the heart-beat became distinctly more regular whilst it was given. The rapidity with which the increase in the quantity of urine appeared and the immediate fall in quantity when caffein was given contrast with the slower appearance of the diuretic effect from digitalis and its longer persistence. The anasarca and ascites diminished somewhat under the caffein, but were quickly removed by the digitalis, which, however, whilst it distinctly strengthened the beat and decreased irregularity, never rendered the pulse quite regular. The stronger action of the heart, however, rendered the evidence of mitral stenosis more distinct. It has been suggested that the combination of caffein and digitalis will be found more useful than either drug separately. I think this is very probable. I have avoided giving them together, in order that I might fairly test the power of the former.

We have not sufficient data to compare the effect of other diuretics with that of caffein, but the good results I have so far obtained from its use seem to me to render it worthy of further trial in ascites and anasarca, especially where other drugs have failed. In cardiac dropsy the utility of caffein seems placed beyond all doubt.

THE IMPROBABILITY OF ANY GENERAL "LAW OF THERAPEUTICS."

BY W. WILBERFORCE SMITH, M.D., M.R.C.P.

THE desirability of a general law that might introduce simplicity into the realm of therapeutics is not in question. With those who advocate its possibility the wish has been father to the thought. In considering the question, it is natural to turn to physical science and its familiar laws for simple illustrations of the broad conditions necessary to the existence of any natural law. For instances, gases are expanded by heat; water rises to its own level; matter is subject to the law of gravitation; the velocity of a falling body increases in the ratio of the distance that it traverses. Here we have several groups of objects to which laws apply. The individual members of some groups differ widely; thus there are many kinds of gases, and many forms of matter. Nevertheless the members of each group possess certain common characteristics of an essential and definite kind. Gases in general, bodies of water in general, innumerable forms of matter, falling bodies in general, possess such group-characteristics. And the fixed truths called laws which apply to each group, obviously apply to all individual objects possessing those essential common characteristics. Physiological laws, although more complex, illustrate the same broad conditions. For example, the law that reflex movements are excited more slowly through the sympathetic than through the cerebro-spinal system, and continue for a longer time after the removal of the exciting cause. This law is illustrated when we compare the deliberate peristaltic movements of the intestines which are excited by irritation of their sympathetic nerves, with the quick spasmodic action

induced by tickling the sole of the foot. Here are definite elements. The practitioner knows certain essential characteristics which belong to each of the two great divisions of the nervous system throughout its extensive distribution. Reflex movements, the exciting cause, time occupied, are each conceptions which differ widely in their details, but about which also certain definite essential characteristics can be predicated as common to each. The proposition can hardly be denied that natural laws apply only to groups of objects or conceptions, the individuals of which groups possess certain definite characteristics which are common to the whole. *A law cannot apply to objects which admit of no such grouping.*

Indefinite words have much to answer for. But for the vague use of the word "disease" practitioners possessed of modern pathological knowledge could hardly be found to maintain the possibility of finding a general "law of cure;" for *diseases in general appear to admit of no true grouping.* There is indeed one way of regarding them which gives them unity, and is sufficiently simple. Superstition and ignorance have in all ages regarded "Disease" as a peculiar entity, a kind of evil influence which has taken possession of the body. But, when analyzed, diseases are found to consist of complex and varying conditions with no common group-characteristics. Every attempt at a scientific definition embracing diseases in general is necessarily vague. Dr. Green, in his admirable *Introduction to Pathology,*[1] writes:—"By disease is understood some deviation from the state of health; a deviation consisting for the most part in an alteration in the functions, properties, or structure of some tissue or organ owing to which its office in the economy is no longer performed in accordance with the natural standard." Probably it would be difficult to improve on this statement. But it contains no indication of any definite characteristic which is common to diseases in general. "Alteration" is of necessity a diffuse and indefinite word. The occurrence even of this vague "alteration" is variable; it takes place only "for the most part." Its seat is indefinite, viz.: "some tissue or organ." The attributes of such tissue or organ which are subject to "alteration" are variable, viz.:

[1] Fourth Edition, 1878, page 1.

its "functions, properties, or structure." To obtain a more comprehensive statement it is necessary to resort to a negative description which is still more vague, viz.: "some deviation from the state of health," and this negative description is merely reiterated in referring to "non-accordance with the normal standard." If the able author were asked what is "the state of health, or "the normal standard," he might vary the reply, but could probably assert nothing more definite than that it is the absence of disease—thus adopting the circular method. It would have been unscientific to have attempted anything more positive.

It is true that our knowledge is imperfect. But all that has been learned tends to indicate that it is not owing to imperfect knowledge that we are unable to group diseases in general, or find a comprehensive definition of "disease." The results of incessant pathological and clinical industry throughout civilisation tend to separate diseases and to group them into subdivisions, but afford no indication that there is anything distinctive that applies to diseases in general.

Take a few patients, say at a hospital out-patient room. One has a misshapen ineffectual valve in that living pump called the heart, and all the mechanical consequences. He is said to have "valvular disease." Another has serious symptoms due to the fact that a growth detached from one of the heart's valves has been washed along in the circulation, and now forms a solid plug stopping up the channel of an artery. He is said to have "embolism." Another has one or more thriving worms, with tentacles fixed in his intestinal mucous membrane, or encysted in his liver. Another has a concretion of a hard fatty substance lodged in a tube which is too small to readily admit it, and the living tube is spasmodically contracting upon the intruder to the agony of the patient,—he is said to have gallstones. Another shows a joint, red, swollen, and painful, and is said to have "synovitis." Another has breathed an atmosphere charged with a special poison, his blood and all the constituent fluids of his body, perhaps the solids too, have become poisoned and poisonous; he has an infectious fever. Some diseases are essentially due to "coarse" alterations, such as the embolism, whilst simple inflammation, or the growth

of a tumour, are essentially connected with delicate microscopic processes. Patients may complain of a variety of symptoms which only by skilled investigation are found to be due possibly to a plug of cerumen in the ear, or a stone in the kidney, or a broken rib. Investigation has progressively removed various diseases from the obscure class, and has found that they depend on causes of a kind which are more or less palpable. It is only within the present century that it has become generally recognised that itch is due to a colony of parasites. Not only is palpable embolism of modern discovery, but the obscure disease chorea is attributed on reliable authority to minute emboli plugging some of the brain's capillaries.[1] Whether "functional disease" has any real existence may well be questioned. Derangement of function probably results in every case from derangement of structure, whether that derangement be coarse and persistent, or whether it be delicate and transitory. As medicine learns more and more of the essential phenomena of diseases, it may be that she will dismiss "functional disease" from her nomenclature and regard it as a mere cloak for the ignorance of the past. The diseases of the nervous system which are commonly called functional, are well classified, for instance, by Niemeyer, as "neuroses of unknown anatomical origin." The word "unknown" is a wholesome and refreshing acknowledgment of ignorance, a salutary improvement on the fine expression "functional." The sight of it sends us back to school, and stimulates inquiry.

Only by shutting the eyes to facts, and referring diseases such as the above to one comprehensive group, does it appear possible to maintain the existence of a general law of nature for their remedy. But if they belong to no common group they can possess no common law. At the present time vendors of patent pills and charlatans find it necessary for their purpose to make comprehensive assertions of the unity of disease. All diseases arise from impurity of the blood, their nostrum

[1] A kind of *uric acid thrombosis* may turn out to be the cause of the gouty paroxysm,—a crystallisation or arrest of uric acid or urate of soda in the degenerate vessels of the gouty, commencing in the languid circulation of the extremities. The deposits in the ear, &c., and all the phenomena, appear to favour my hypothesis, founded on Dr. Garrod's discovery, of the presence of uric acid in the blood of gouty persons.

corrects this, and is therefore a universal remedy. Or all diseases arise from failure of nervous power. Phosphorus or electricity, according to the particular view of the advertiser, is therefore a universal remedy.

To maintain the existence of a universal law of therapeutics appears nearly as unreasonable as if a watchmaker were to advocate a single principle of dealing with the derangements of a watch. The watch may be suffering from congenital imperfections, or on the other hand from senile degeneration, resulting in organic defects; it may be deranged by the presence of foreign bodies, such as dust, or by general injuries, such as a concussion. Paralysis from local injury, such as a fractured spring, must be distinguished from "functional" paralysis, the result of not being wound up. Sometimes it is a question of "humoral pathology" and oil is required. Sometimes there is derangement connected with undue "oxidation" from climatic vicissitudes.

Now a watchmaker fond of generalisations might possibly regard all watch diseases from a comprehensive point of view. He would imitate the medical writers who theorise about "disease." Naturally he would seek a common "law of cure," or having already advertised the "law of cure," he might not improbably theorise about "disease" in watches, to explain its *modus operandi.*

Had Hahnemann contemplated the facts of modern morbid anatomy and pathology, it is doubtful whether he would have written such a sentence as this:—"To effect a mild, rapid, certain, and permanent cure, choose *in every case of disease,* a medicine which can itself produce an affection similar to that sought to be cured." Practitioners seem unconsciously clinging to mediæval traditions when they talk of the possibility of a natural common "law of cure." So long as an entity, "disease," is contemplated, the idea is tenable enough. But the bogey belongs to polytheism. Its ancient adherents associated the medical practitioner with magicians, astrologers, and wizards. His duty was by the combined use of drugs, rites, and incantations, to charm, coax, or frighten away the mysterious evil thing that had taken its abode in the unfortunate patient. The "medicine man" of savages has

similar duties. And the kind of phraseology commonly dealt in by the best exponents of a supposed comprehensive law of therapeutics is significant. It indicates how impossible it is to maintain their doctrine except by theorising about the imaginary entity—"disease." Such language, and the ideas associated therewith, tend towards the arrest and retrogression of medical knowledge, just as the superstition of the Middle Ages brought all science to a standstill.

I will quote Dr. Dudgeon's first *Lectures* on this point to show how a writer may be ordinarily distinguished by logical discernment, yet may fall into this habit when discussing the special theory that he advocates, although writing many years after Hahnemann. On page 115,[1] he justly deprecates allowing ourselves "to mistake words for ideas, or to accept error, however ancient or time honoured, for truth." He discusses the "theories of cure" of various homœopathic authors, all strongly imbued with pagan notions of good and evil entities, and tending to indicate how benign influences prevail over the bogey under the auspices of homœopathic doses. St. George triumphing over the dragon would be an apt emblem of the therapeutic conflicts described. (Why should not some enterprising homœopathic chemist adorn his premises with such a model, as a change from the intellectual-looking yet over-familiar bust of Hahnemann, or occasionally in "alternation" with the latter?) Dr. Dudgeon then explains what he regards as a truer theory, and it is surprising to find how, in doing so, he becomes himself involved in such language as this (p. 110):—

"Now, to the production of morbid action I have stated that the morbific agency acts by inducing over-irritation of the part on which it acts, causing increased vital action, which is followed at a greater or less distance of time by diminished vital action, which gives rise to those phenomena we call disease. The morbific agents then, natural and medicinal, are both primarily irritant, and cause increased vital action. When a case of disease presents itself to us, we have before us an instance of diminished vital action, in order to remedy which, by the method under consideration, we must apply an irritant capable of stimulating the diseased part up to the healthy level. Now, the medicine that will cause the same morbid symptoms as the disease in question must in its primary action be an

[1] Dudgeon's *Lectures on Homœopathy*.

irritant that acts on the same part or parts as those diseased, and obviously this medicine will be the remedial agent for this disease, if we can so regulate its power as to cause it to do no more than stimulate the diseased part up to the normal level, when of course the disease will be extinguished and healthy action restored," &c. &c.

It would not be fair to quote the above as necessarily indicating the author's present views, for his *Lectures* were published in 1854, and there have long been signs that the more capable homœopaths feel that their old ground is hardly tenable. In 1866, Dr. Francis Black is reported to have said that "his faith 'remains unshaken in the homœopathic law that medicines tend to cure diseases similar to those they tend to produce.' But he does not look on this as 'a natural law which is universal and admits of no exception,' but rather as a 'rule of art depending on some deeper truth as yet undiscovered.'"[1] And in 1868, Dr. Gibbs Blake wrote[2]:—"I think we must be content to claim for our formula a place amongst the empirical laws, and wait until extended observation and experiment either show that it is resolvable into a more general natural law, or that it is itself a natural law, and the exceptions which are observed are only apparent. I confess that the former appears the more likely." A partial departure from the last position of Hahnemann's system is thus advisedly adopted. A special name and a special profession exposed to the eyes of the laity appear to furnish the only distinctive ground which such practitioners retain in common.

It is wholesome to recognise that there is wanting the first essential condition of a general "law of cure," and that it is in the nature of the subject that this should be so. If there is a group of facts which appear to accord with the crude formula *similia similibus,* it is very desirable that their true relationship and limits should be defined. The task may be difficult but it is not insurmountable. It is time to repent of the rashness which deduced from such facts a general "law" of therapeutics.

[1] Paper read at British Homœopathic Society by Dr. F. Black, reported in *Abstract of Homœopathic Literature,* 1877.

[2] *Monthly Homœopathic Review.* Quoted in *Abstract of Homœopathic Literature.*

Observations on Contraction of the Fingers (Dupuytren's Contraction) and its Successful Treatment by Subcutaneous Divisions of the Palmar Fascia, and Immediate Extension. Also on the Obliteration of Depressed Cicatrices. By WILLIAM ADAMS, F.R.C.S., Surgeon to the Great Northern Hospital, &c. London: J. and A. Churchill, 1879. 8vo. pp. 80.

WE are glad Mr. Adams has thought fit to publish in the form of a pamphlet an account of his excellent operation for the relief of contraction of the palmar fascia. From the delicacy of manipulation required in its performance, and the close proximity of numerous vessels and nerves to the cutting edge of the knife, it is an operation which will probably only be performed by those dexterous in such matters, or who are frequently engaged in operating. But from what we have heard and seen there appears little reason to doubt that the results are better than from any other subcutaneous proceeding, while the dangers of open wound are entirely avoided. The great advantage of being able to curtail the after-treatment and dispense with expensive apparatus is obvious. We are only puzzled to understand why Mr. Adams should think it necessary to occupy so large a space with an elaborate dissertation on the anatomical conditions of the disease when he has little more to tell us than was quite as well, if not better, told nearly fifty years ago by Dupuytren and Goyraud. Of the operation for the removal or bettering of depressed cicatrices we have no knowledge other than that which is so well conveyed in the account given in this little book.

A Text Book of Physiology. By M. FOSTER, M.A., M.D., F.R.S. Third Edition. 8vo. pp. 880. London: Macmillan and Co.

THE short time which has elapsed since the appearance of the second edition of this work shows how much its value is appreciated, while a comparison between the two editions shows how actively physiology is being studied, and how rapid are the advances made in it. Although the chief changes have been made in the section on muscle and nerve, which has been entirely rearranged, yet alterations are numerous throughout the work, and the additions have increased its bulk by no less than a hundred and eighty pages. The author has evidently done his best to keep the book up to date and to maintain for it the

position it at present holds of the best text-book of physiology in the English language. There can be no doubt that physiology is the basis of scientific pharmacology, pathology and therapeutics, and therefore no one who wishes to keep up with the progress of medicine can do without physiology. Yet the teaching of this branch of medical science has changed so much during the last fifteen years that it is extremely difficult for those whose student days were over before the change began to comprehend thoroughly the scope of such a work as the present, and so they will sometimes take it up and afterwards throw it aside as too hard reading. To all such, as well as to students beginning the study of physiology for the first time, we would recommend the perusal first of all of Foster's *Primer of Physiology*, from which they will gain a knowledge of the chief points without any risk of being confused by details. Next let them take up Huxley's *Physiology*, and after having carefully read it they will be able to peruse the present work with pleasure as well as profit.

Syllabus of Lectures on Physiology. By J. BURDON SANDERSON, M.D., LL.D., F.R.S. Second Edition. 8vo. pp. 143.

THE object of this work is entirely different from that of Foster's text-book, for while the text-book gives a full account of what is known regarding the functions of the animal body this syllabus gives only a brief notice of the most important things so as to refresh the memory of the student who has already obtained a knowledge of the subject from text-books or lectures. In addition to this it contains brief but clear directions for performing the most important physiological experiments in physiological chemistry, and on the functions of muscle and nerve so far as they can be observed in animals nearly dead. There is also appended a list of demonstrations of the functions of respiration, circulation, and action of the nervous system suitable for performance by lecturers on physiology. The work supplies a want, and will be useful both to lecturers and to students.

Lecture Notes on Chemical Phyisology and Pathology. By VICTOR C. VAUGHAN, M.D., Ph.D. Second Edition. 8vo. pp. 315. Ann Arbor: Ann Arbor Printing and Publishing Company.

IN its plan this work somewhat resembles the one which we have just noticed, but it is much fuller though more limited in its scope. Instead of including the whole of physiology it takes up physiological chemistry only. It gives an account of the properties and characters of the various secretions and tissues met with in the animal body, describes the methods of analysis employed, the tests by which the various compounds may be recognised, and in addition discusses the pathological significance of abnormal conditions which are shown to exist by means of

chemical methods. At the end of the work are some exceedingly useful tables for analysis of the urine, in which the reaction of the liquid, the form of the crystals when present, and their pathological indications are all placed in a tabular form so that the student or practitioner is enabled to discover with great ease the nature of any alteration in the urine he is examining, and to infer from it the pathological condition which is present. The method of detecting the chief medicinal substances in the urine is also given. This section includes the detection of morphia, strychnia, veratria, atropia, santonine, iodine, bromine, arsenic, antimony, and mercury. We think that the methods of detecting salicylic acid and carbolic acid, and even of rhubarb, would prove a useful addition to this section in another edition, which we have no doubt will ere long appear as the work is a convenient book of reference and will no doubt command a large sale.

Manual for the Physiological Laboratory. By VINCENT HARRIS, M.R.C.P. (Lond.), and D'ARCY POWER, B.A. (Oxon).

THIS manual is intended for students of histology and physiological chemistry. Under histology, the authors first give a brief account of the methods of hardening, cutting, staining, and mounting sections. Under each tissue directions are first given for the mode of preparing it for microscopic observation, after which follows a brief account of the structure of the tissue.

Under the head of Physiological Chemistry, the more important characteristics of the chief substances are briefly noted, and the most important mode of use is described. The work is the result of considerable experience of the requirements of students, and therefore is likely to be of much practical service.

Notes on Physiology. By HENRY ASHBY, M.D. 2nd Edition, pp. 275. London: Longmans, Green, & Co.

THESE are intended for the use of students preparing for examination. They give the chief facts of physiology in a short compass, and, so far as we have seen, correctly, and seem well applied to the purpose for which they were intended.

Aids to Physiology. By B. THOMPSON LOWNE, F.R.C.S. (England), pp. 104. London.

THIS work is intended for the same purpose as the preceding. In those parts where we have compared the two we have found this one even more strictly accurate than Mr. Ashby's. It is not so much arranged in tabular forms. To some students this will be a disadvantage, though others, no doubt, will prefer the more easy style.

Clinic of the Month.

Treatment of Lupus Erythematodes.—Dr. M'Call Anderson adopts the following method of treatment in cases of lupus erythematodes, and from it has obtained good results in regard to this obstinate affection:—℞ Iodidi gr. xxiv: Amyli ℥j. Triturate the iodine with a little water, gradually adding the starch, and continuing the trituration till the compound assumes a uniformly blue colour, so deep as to approach to black. The iodide should be dried with a heat so gentle as to run no risk of driving off the iodine, and it ought to be kept in a well-stoppered bottle. On no account should spirit be used in its preparation instead of water, as is sometimes recommended. The dose is a heaped-up teaspoonful in a draught of water, or water gruel thrice daily: but it may be safely increased, even up to an ounce in some cases, if necessary, to make an impression on the disease. Dr. Anderson has generally found that if this treatment be going to do good in lupus erythematodes, the first named dose is sufficient. He adds however a word of warning to those who give it a trial, viz.: that the cases treated should be undoubtedly cases of lupus erythematodes and not of lupus vulgaris: and that the medicine should be freshly prepared and in accordance with the directions above mentioned. Iodide of starch is also an excellent remedy in other diseases, and notably in long standing cases of syphilis. (*The British Medical Journal* May 1, 1880.)

Chian Turpentine in Cancer.—Prof. Clay gives the following method for distinguishing true from false Chian turpentine. The pure drug is of such a solid nature that a portion taken between the fingers may be rolled into the form of a pill without adhering to the fingers; it thus differs from a large number of spurious specimens which have been supplied to the public, and which for the most part have been of a syrupy consistence. The odour of the genuine drug is peculiar. If a portion

be softened between the fingers, the fragrant odour can be readily perceived, and it is not by any means similar to that of turpentine oil, whilst the spurious kinds smell strongly of the latter substance. The taste of the pure article is characteristic in not being unpleasant; indeed it is almost tasteless. The taste of most of the spurious kinds is very bitter and unpleasant. The brittle yet elastic nature of the pure drug is very striking. If a piece is warmed and rolled out, and is allowed to cool, and it be afterwards dropped on the floor, it generally breaks into a a number of fragments. If a mass is placed in a shallow vessel, it usually flattens and spreads over the vessel, the surface being smooth. When the pure drug is placed between two pieces of warmed glass, it is seen to be transparent, of a yellowish brown colour, and much contaminated with various impurities, in a state of fine division. It is best to take a slip of glass, warm it very slightly with a piece of lighted paper, clean it, and then place the drug to be examined upon it, cover the drug with another slip of glass, and allow both to cool; then, by holding the double glass up to the light the characters are readily distinguishable. If the drug is spurious, consisting perhaps of strained crude turpentine, or Venice turpentine, and it be so placed between warm glass, it will present the appearance almost of water. If Chian turpentine is adulterated with Canada balsam, on a gentle heat being applied to the glass on which it is applied, the Chian turpentine remains in the centre, whilst the balsam flows over the glass, since the former requires a stronger heat to liquefy it. If black resin is mixed with Venice turpentine, to make the specimens resemble the impurities of the real article, the compound is of a syrupy consistence only, and on heating the mass sufficiently between two glasses the resin is melted, so that the apparent impurities which it presented disappear, whilst these remain permanent in the genuine drug. Canada balsam becomes transparent when it is heated, perhaps more so if the heating is repeated, and the smell is of a well-marked sickly odour. If the spurious fluid consist largely of resin, and a piece is put on a spatula, and a lighted taper be then applied to it, the characteristic resinous odour is at once perceived. The taste, odour, and appearance then are the chief characteristics of the drug. If it has a bitter taste, it is not pure, if it has not much taste as a mixture of resin and Canada balsam, on burning the mass the peculiar odour will reveal its impurity. If the mass does not dissolve in alcohol, but leaves a glutinous residue, then, all other things being equal, it is pure. If it is of a greyish white, or black colour even, mixed with impurities, and of a syrupy consistence, it will have a strong smell of turpentine, and is not pure. (*The Lancet*, May 15, 1880.)

The Treatment of Constipation.—Dr. Robert Smith recommends that in cases of constipation the individual should daily at the same hour make powerful defæcatory efforts. Should these efforts be unsuccessful, he must still be urged to persevere. This daily repetition of the attempt to defæcate usually ends by a daily need for the relief of the bowel at that hour. During the treatment it is sometimes necessary to procure an evacuation. An enema of tepid water, followed by one of cold, will generally be sufficient for this purpose; a suppository of belladonna, or one of ordinary yellow soap, or of honey hardened by heat, is equally efficient. Purgatives are not to be used except under the greatest necessity, and then a pill of colocynth with hyoscyamus is sufficient. Mineral waters are frequently of great service, particularly those of Carlsbad and Cheltenham, a tumblerful taken warm before breakfast being often found to act effectually in keeping the bowels in healthy action. Belladonna in a single dose of one-sixth to one-fourth of a grain of the extract taken fasting by preference in the early morning has also been used with success. Excellent results have also been obtained from the use of sulphate of zinc and strychnia. Much of the success of the treatment will, however, depend upon the directions as to habit and diet. The tablespoonful of cold water at night, the cold bath and cold compresses to the abdomen in the morning, the taking of large quantities of fruit, the use of oatmeal porridge and of bran bread, the cigar after breakfast, the daily walk, have all their influence in bringing about the desired end. For infants the use of oatmeal boiled in milk, an occasional soap suppository, abdominal friction with the warm hand, combined with small doses internally of cod-liver oil, have never been found to fail. In all cases of constipation, however, it is absolutely necessary to obtain the confidence of the patients. (*The Lancet*, May 22, 1880.)

Cotton-wool as a vehicle for Medicating the Nasal Region.—Dr. Woakes, in view of the want of a satisfactory means of applying medicaments to the post-nasal region, suggests medicated wool, for the use of which he gives the following directions:—The quantity of wool determined upon, usually from two to three grains by weight, is twisted spindle-shape, but loosely, upon a piece of thread or silk; the thin ends are brought together or tied with a knot; thus the spindle-shaped pledget of wool is doubled upon itself and secured firmly to the thread, having now a pear-shape, the stalk being represented by the thread. A blunt probe is engaged in the wool and made to conduct it along the floor of the nose to the spot where it is to be retained. The process is then repeated on the other side, the threads from each pledget hanging out from

either nostril These are now tied together below the septum, by which means the patient will be assured the wool will not be swallowed. In the morning, supposing the application to be made overnight, they can be withdrawn by pulling on the threads. In this way any drug that may be selected can be introduced with ease, and with a little skill in the manipulation, the vault of the pharynx, Rosenmüller's fossa, or the neighbourhood of the Eustachian tubes, may be topically medicated. If it is desired, several such pledgets may be introduced in succession, until a sufficient quantity has been placed *in situ;* the threads belonging to all can then be tied together and secured. Dr. Woakes also gives the following formulæ for the preparation of medicated cotton-wools:—*Astringents:* Perchloride of Iron Wool: cotton-wool, one drachm; glycerin, ten minims; tr. fer. perchlor., one ounce. Tannin Wool: cotton-wool, one drachm; glycerin, ten minims; tannin, one drachm; rectified spirit, six drachms. Alum Wool: cotton-wool, one drachm; glycerin, ten minims; alum, half a drachm; water, one ounce. Rhatany-kino-catechu Wool: cotton-wool, one drachm; glycerin, ten minims; tr. catechu vel rhatany, one ounce. Hamamelis Wool: cotton-wool, one drachm; glycerin, ten minims; tr. hamamelis, half-an-ounce. *Anti-catarrhal:* cotton-wool, one drachm; glycerin, ten minims; tr. cubebæ, one ounce. *Antiseptic, disinfectant, and stimulant:* Camphor Wool. cotton-wool, one drachm; glycerin, ten minims; æth. rect., one ounce. Boric- or Boracic Wool: cotton-wool, one drachm; glycerin, ten minims; boric acid, one drachm; sp. vin. rect., six drachms. Iodine Wool: cotton-wool, one drachm; glycerin, ten minims; tr. iod., half an ounce. *Sedative;* Opium Wool: cotton-wool, one drachm; glycerin, ten minims: tr. opii, half an ounce. *General directions:* Mix the glycerin with the tincture, or other solvent; saturate the wool with the liquid, and dry. (*The Lancet,* June 5, 1880.)

The Croton Oil Treatment of Ringworm.—Dr. Alder Smith is opposed to the production of kerion indiscriminately in chronic ringworm, especially where a large extent of surface is involved, since ordinary chronic forms can generally be cured without it. For such cases, painting the places with croton-oil liniment is a good plan, but other remedies will often cause a moderate amount of inflammation and even slight suppuration, and thus cure the disease. Citric ointment with carbolic acid will frequently produce this result, especially in young children. In Dr. Smith's experience the following are the most suitable cases in which the production of kerion may be attempted:—(1) Inveterate cases which have resisted all other treatment for months and years, if they are not very extensive, especially

those in which the inveterate parts of the patches have been marked out and reduced in size by other treatment, as by oleate of mercury. (2) Any small patch of ringworm not larger than half-a-crown, where time is of the utmost importance, and a cure is desired as quickly as possible. (3) In such cases as where ringworm has been detected and properly treated for a time until the new hair has made its appearance: after which it has been discontinued, although many diseased stumps remain, and it is required, at a long subsequent period, to complete the cure. (4) Cases of disseminate ringworm. (*The British Med. Journal*, June 12, 1880.)

The Diagnosis of Rötheln.—Dr. Robinson states that rötheln, in its general character, presents various degrees in severity, just as in the allied diseases scarlatina and measles. In the simple form, the rash is well out, the sore throat is slight, and the irritation of the bronchial mucous membrane is moderate, with slight coryza and sneezing. In the severe form the catarrhal symptoms are still very perceptible, but the brunt of the attack is borne by the throat. There is also an intermediate variety, in which the general symptoms are severe, and the influence of the poison is exerted equally upon the skin and on the mucous membranes. The period of incubation seems to vary, but it is generally about six or seven days, at the end of which time the symptoms of a slight cold make their appearance, speedily followed by a considerable and sudden rise of temperature; hoarse cough and sore throat accompanied by watering of the eyes: headache in adults or a convulsion in children; sickness, and sometimes severe vomiting. On the second day of the fever the rash makes its appearance, usually first on the neck and chest, afterwards on the trunk, face, and extremities, in patches of various size which soon coalesce and form larger ones, less crescentic in form and of a brighter colour than in measles, attended by considerable itching, and perceptibly raised above the level of the surrounding skin. It begins to fade on the following day, its complete subsidence being rarely prolonged beyond the third or fourth day, with slight desquamation of the cuticle which in mild cases is almost imperceptible. The temperature, at first very high, often reaching 103° to 104°, falls with the subsidence of the rash, unless the throat symptoms, always present, predominate, when it continues high until the termination. The pulse may be 120 to 130, or even more frequent, declining suddenly with the temperature. There is sneezing, and the eyes are suffused, but severe coryza is absent; hoarse and troublesome cough with sometimes severe bronchial catarrh is also present. In mild forms of the disease it most

resembles an attack of measles, with sore throat of varying intensity, and swelling of the cervical glands. In the more severe types it is most like scarlatina angiosa, with the rash and catarrhal symptoms of measles. Dr. Robinson has not observed any suppuration of the cervical glands, albuminuria, or dropsy, even when the scarlatinal symptoms seemed to be in the ascendant. The most frequent complications appear to be bronchitis and pneumonia The mortality is low, death occurring most frequently from chest complications. The essential points in the diagnosis of rötheln from measles are in the presence of the throat and gland symptoms, and the early period at which the rash makes its appearance; and from scarlet fever in the presence of catarrhal symptoms, the character of the rash, the manner in which desquamation of the cuticle takes place, and the complete absence of the sequelæ common in scarlatina. The strongest evidence of the non-identity of rötheln with those two diseases, separate or combined, is that it is not protective against an attack of either, or *vice versâ*. (*The British Medical Journal*, June 19, 1880.)

Pilocarpin in the Treatment of Prurigo: the Diagnosis of Prurigo.—Professor Oscar Simon, of Breslau (*Berliner Klinische Wochenschrift*, No. 49, 1879,) has used preparations of jaborandi with good effect in cases of prurigo both in adults and children. Hebra's prurigo, which is a rare disease in England, is comparatively common in Breslau, and forms about 3 per cent. of the non-venereal cases in the skin clinic of the University; this method of treatment, therefore, is of less interest to us than to the Germans, but it deserves at least a short mention here. Either subcutaneous injections of one gram of a 2 per cent. solution of hydrochlorate of pilocarpin or a syrup of jaborandi were used. The latter is an infusion of three parts of jaborandi-leaves in fifteen parts of boiling water, filtered and mixed with eighteen parts of sugar. The dose for an adult is two or three tablespoonfuls, for small children a tea-spoonful, for older children two teaspoonfuls. After the dose the patient was always wrapped up in blankets for two or three hours. The salivation and other well-known effects of pilocarpin accompany the sweating, which seems so valuable to the pruriginous patients. Professor Simon compares its influence to that of a bath or an ointment. It softens the dry, harsh skin, and probably relieves the openings of the sweat-ducts of the accumulations of epidermis which, as the microscope shows, blocks them in prurigo. On the average, a fortnight's pilocarpin treatment temporarily cures moderately severe cases of prurigo, while a month suffices for all but the very worst. We need

scarcely add that it does not permanently cure; relapses occur as under other plans of treatment. Professor Simon has not found pilocarpin of use in other skin affections. In two or three cases of alopecia the result was undecided. He makes some valuable remarks in the second part of his paper on the natural history of true prurigo; especially he points out the difficulty of diagnosing it accurately in the early years of life owing to the similarity of the lesions to those of infantile prurigo (*Lichen urticatus*). He considers that we cannot be absolutely sure of the diagnosis before the end of the fourth year. "A prurigo which runs on after this is incurable." As to etiology, he agrees with Hebra, that the parents of the pruriginous, and especially the mothers, are often phthisical; but he has never seen a case of hereditary transmission, though more than one child in the same family is sometimes affected. (*The Med. Times and Gazette*, Feb. 21, 1880.)

The Blood in Febrile States.—M. Hayem, who has added so much to our knowledge of various morbid states of the blood, has lately published some observations on the minute alterations in the mode of formation of the coagulum in various febrile states. When the blood is spread out in a thin layer under the microscope, the corpuscles are seen to assume a special arrangement. The irregular spaces which the rouleaux leave are larger and less numerous than under normal conditions. If, after coagulation, an attempt is made to separate the elements, it is found that the corpuscles are united by extremely fine filaments of fibrin, which cause them to assume very irregular shapes; they present also an abnormal viscosity when compressed by the surrounding fibrin. Other changes which the blood presents cannot be with certainty ascribed to the inflammatory processes. Even when the pyrexia is high, there is no alteration in the dimensions of the red corpuscles. The increase in the number of leucocytes affects equally all forms of pale corpuscles, their amœboid movements are the same as in health, except that they are somewhat interfered with by the filaments of fibrin which adhere to them. Many "hæmatoblasts" occupy the empty spaces, and, like the red corpuscles, they become more viscous and adherent one to another, and hence quickly form masses, notably larger than those seen in normal blood. Very soon a reticulum appears, considerably denser than in other circumstances, the constituent filaments being thicker and closer than those of normal blood. During this formation, the hæmatoblasts have fused together into little blocks of waxy aspect, to which large numbers of fibrils are attached, giving them a characteristic appearance of balls of

spines. The excess of fibrin in the blood gives rise to another appearance, if the blood is diluted with the liquid used in the ordinary numeration of the corpuscles; minute solid particles become visible to the naked eye in the mixture, an appearance never seen with normal blood. These particles are composed of hæmatoblasts, surrounded by a finely granular or fibrillar substance, to which many leucocytes and red corpuscles adhere. These changes in the blood may be found, although in a less marked degree, in cases of chronic, as well as in acute inflammation. (*The Lancet*, June 19, 1880.)

Effects of Cantharidin.—M. Cornil offers the following remarks upon the condition of the kidneys and bladder in cases of rapid poisoning by cantharidin. There is a migration of both red and white blood-corpuscles out of the capillaries of the glomeruli almost immediately after the injection of a small quantity of cantharidin beneath the skin. The cells lining the capsule of the glomerulus and the convoluted portions of the urinary tubule became swollen, and impregnated with a fluid containing hematic granules. Inflammation of the straight and collecting tubes occurred shortly afterwards, that is to say, the cells lining these parts, which in the normal condition possess a definite shape, became irregularly polyhedral. The bladder after the emission of a large quantity of urine within 15 or 20 minutes from the introduction of the poison becomes contracted. Its surface is red, and it contains a few drops of turbid urine, in which white blood-corpuscles, and very large spherical, elongated, or flattened cells may be detected. An hour later, the large cells which contain 8-10 round nuclei, are seen to be in some cases free in the urine, whilst others are adherent to the surface of the mucous membrane from which they are in the act of separating themselves. These elongated cells have irregular borders; their protoplasm is granular, solid, homogeneous, and is stained yellow with picrocarmin, whilst the nuclei become red. Nuclei may be frequently seen to divide, or smaller nuclei may be noticed lying by the side of the larger ones.—(*Arch. Gén. de Méd.* April, 1880.)

Chloral Hydrate in Acute Gastro-Enteritis of Children.—Prof. Adolphe Kjellberg finds that there is no medicine which is of so much use as chloral in checking the vomiting in acute gastro-enteritis of children. Being rapidly absorbed it stops the vomiting, calms the patient, and often checks the diarrhœa. It is best given by enema, so as not to risk its rejection by the irritable stomach. It should be given soon after the bowels have been moved. The dose for a child of from five to six months is

25-30 centigrams ($3\frac{1}{2}$-4 grains); whilst for a child of 12-15 months 50-60 centigrams (7-$8\frac{1}{2}$ grains) may be given. The bulk of the injection should not exceed a dessert spoonful. The enemata may be repeated two or three times daily, and the dose may be increased if it is found necessary. In order to increase the effect of the chloral, the author generally adds to each enema a drop of tinct. opii, and if stimulants be indicated, 5-15 drops of liq. Hoffman. At the same time other remedies are not to be neglected—iced water, cognac, or champagne for vomiting, opium for the diarrhœa, hot mustard baths for albuminuria should it occur, stimulants for collapse, &c. &c (*Nordisht. medicinsiht. Arkiv* xv. 5; *The Dublin Journal of Med Sci*, March, 1880.)

Method of Masking the Odour of Iodoform.—Tannin which was recommended by Moleschott as a means of hiding the unpleasant smell of iodoform has not been wholly successful Ether which conceals the odour, on account of its great volatility is only useful for a short time, whilst oil of peppermint has not answered to its expectations. Dr. Lindemann of Munster contributes to the *Allg. Med. Centraezeitung* an account of experiments which he has made with several preparations in regard to this subject. The conclusion at which he has arrived is that the balsam of Peru completely masks the smell of iodoform, and renders it imperceptible to the most delicately organised. He mixes two parts of the balsam with one part of iodoform, and recommends vaselin as being the best medium for an unguent; it may also be employed in an aqueous solution. The following useful formulæ are subjoined:

℞ Iodoform.	1	gram.	℞ Iodoform.	1	gram.
Bals. peruv.	2	„	Bals. peruv.	3	„
Vaselin.	8	„	Spir. vin. rectif.		
M. f. ungt.			or glycerin.	12	„

In regard to the preparation of these prescriptions, the author recommends that the iodoform should first be mixed with the balsam, and that the vehicle should afterwards be added. (*Schweiz. Correspbl.* 20, 1879.)

A New Disease in Calcutta.—Assistant Surgeon Kastagir calls attention to a new form of disease which has recently appeared in a limited district in Calcutta. The affection is characterised by distinct fever and anasarca beginning from the lower extremity and generally extending to the face and neck. The bowels are usually affected from the beginning with dysentery; whilst in those cases in which it is not present at first, the slightest irritation such as is caused by a mild dose of castor-oil is sufficient to produce an attack. The lungs are also

occasionally affected, moist crepitation being the usual indication. The disease which broke out in damp, dirty, and ill-ventilated houses, takes a definite course, and appears to be amenable to tonics; it seems to bear certain relations to that form of general dropsy which is known to the Singalese under the term Beri-beri. (*The Indian Medical Gazette*, March, 1880.)

The Use of Water in the Treatment of Skin Disease.—Dr. Bulkley recommends the use of the ordinary warm bath in scaly eczema, psoriasis, ichthyosis, lupus and obstinate ulcerative syphilis, and of the continuous bath as employed by Hebra in burns, pemphigus foliaceus, phagedæna, &c., but he warns against their use in acute and certain subacute forms of eczema, as well as in urticaria. The reaction and exposure to the air which follow in river or lake bathing will aggravate most skin diseases. Sea-bathing is of service in psoriasis and occasionally in chronic urticaria, though it is hurtful in eczema and acne. In the eczema both of children and adults the affected surface should only be washed rarely, since time is thereby given for the formation of a more resisting epidermal covering. In psoriasis the wet packing employed twice daily for several hours, morning and evening, has been found to yield excellent results. Dr. Bulkley believes that vapour and hot air baths should only be used in skin diseases after the most careful consideration. Baths may be medicated by means of carbonate of potash, carbonate of soda, and powdered borax, four, two, and one ounce of each, respectively, together with from one quarter to one half pound of starch to a bath of thirty gallons. This is a mild alkaline bath, which is decidedly soothing to most skins, and acts very favourably on sub-acute eczema and urticaria. It may be used much stronger, as in psoriasis, ichthyosis, and prurigo. The bath is to be given at bedtime, at a temperature of from 87°-95° F., the patient remaining in the water fifteen or twenty minutes. On coming out, if the skin is pruritic, it is not to be rubbed, but dried with a heated sheet, and all diseased surfaces are to be covered at once with a suitable ointment. Such an ointment may consist of glycerite of starch or cosmolin, to which a small quantity of carbolic acid (five to ten grains to the ounce) have been added. In the medication of the bath the starch may be replaced by well boiled gelatin, half a pound to the bath; or glycerin four to ten ounces to the bath. Sometimes the soda and potash prove too drying, when the quantity of borax may be increased, with a proportionate diminution of these ingredients. In the treatment of obstinate cutaneous affections the natural mineral springs should never be forgotten. (*The Chicago Journal and Examiner*, Jan. 1880.)

Histological Changes in the Kidneys accompanying Parenchymatous Interstitial Nephritis.—Dr. Cornil has studied, by means of osmic acid preparations, the changes which the kidney undergoes in various pathological conditions. In a case of acute nephritis with marked swelling of the cortical substance, in which death had been preceded by symptoms of uræmia, he found that the tubuli contorti were dilated. The epithelium of these tubes was regularly vacuolated, the vacuoles being filled with albuminous drops. Albumin and red blood corpuscles were also found free in the lumen of the tubes. From these appearances Dr. Cornil concludes that the albuminous particles formed in the epithelium cells, together with the blood corpuscles, give rise to the hyaline casts of nephritis The vacuolated appearance of the epithelium was also found in a case of uræmia poisoning in interstitial nephritis. In the albuminuria of scarlet fever the osmic acid method showed the presence of coagulated masses arranged in a meshwork within the convoluted tubes. No changes, however, were observed in the glomeruli. In cases of chronic nephritis in which the epithelium had undergone fatty degeneration, it was noticed that the appearance of oil globules was often accompanied by a marked swelling of the epithelial cell. Albuminous particles as well as fat globules were also recognised in the cells. The cells die and discharge their contents into the uriniferous tubules; the formation of casts appears to be due to the same causes as in the preceding case. (*Centralb. f. die Med. Wiss.*, April 3, 1880.)

Boracic Acid in the Treatment of Eye Diseases.—Dr. Theobald has found that boracic acid is especially efficacious in the treatment of purulent conjunctivitis, including gonorrhœal ophthalmia and ophthalmia neonatorum, catarrhal conjunctivitis, asthenopia from whatever cause arising, and the conjunctival hyperæmia which usually accompanies it. In phlyctenular ophthalmia, atropia and yellow oxide of mercury leave, in the majority of cases, little else to be desired, but when the inflammation is chiefly conjunctival and somewhat catarrhal in type, these remedies do not always act so well, and in this condition boracic acid will be of service. In relieving atropinism, and when used with the atropia in preventing it, it is undoubtedly of the greatest use. In inflammatory affections of the cornea so far as it has yet been tried, the results are decidedly favourable, and its use may be recommended in pannus, ulcerative and suppurative keratitis, and in the various forms of diffuse corneal inflammation As an adjunct to the probe in the treatment of lachrymal affections it promises to be of much value. In marginal blepharitis, an ointment containing ten grains of

the acid to a drachm of simple cerate has been found of unmistakable service in some cases. Finally, with boracic acid substituted for carbolic acid, the principles of antiseptic surgery may be applied to the graver operations upon the eye In asthenopia, in catarrhal conjunctivitis, and in keratitis, a solution containing two to four grains of boracic acid to an ounce of distilled water may be used, preference being in most cases given to the latter strength. Three to four applications in the course of the day will, as a rule, be sufficient, but if necessary, it may be applied more frequently with safety. In the different forms of purulent conjunctivitis, and more especially in gonorrhœal ophthalmia, stronger solutions will most probably be required; and since even a saturated solution, gr. xx. to ℥j. causes only a most trifling and momentary irritation, it will be better, when the case can be kept under observation, not to trust to a solution of less strength. Boracic acid exercises in regard to the eye astringent and antiseptic properties, and in addition a topical influence which may properly be termed sedative or anodyne. (*The New York Medical Record*, Feb. 7, 1880.)

Absorption of Drugs by the Placenta.—Porak detected in the new-born infant traces of the following drugs which had been administered to the mother just previous to her labour:—iodide of potassium, chloroform, salicylic acid, salicylate of soda, sulphate of quinin, santonin, oil of turpentine, and nitrate of potash. Every medicine given to the mother was found in the urine of the new-born infant. Though there is apparently no law as regards the quantity or rapidity of the absorption through the placenta, yet there appears to be no variation in the law of absorption for any one drug. Porak has also noticed that drugs pass out by the urine of the new-born less rapidly than in later life, hence he concludes that the placenta helps to eliminate drugs during fœtal life. He draws the following therapeutical conclusions: that drugs administered to the mother at the time of labour are liable to cause more injury to the fœtus than when they have been given at an earlier period of pregnancy. In his opinion quinine injures the fœtus. (*Arch. de Toxicol*, 1879; *The Boston Med. and Surg. Journal*, vol. c. i., 1879.)

Heliotherapy.—Chronic affections of the joints of whatever nature, traumatic, rheumatic, or otherwise, are exceedingly difficult of treatment. Various remedies have therefore been recommended, from warm sand, inunctions of tartar emetic and painting with iodine, to the use of cantharides, and more recently physicians have resorted to the use of the plaster of Paris dressings, and the much-praised shampooing. Stimulated by the good results obtained by Prof. Vanzetti in Padua, from the influence of the rays of the sun upon obstinate affections of the

joints, synovitis and white swelling, Dr. Giuseppe Marzari was led to adopt the same method of treatment in several cases. He had published a preliminary account of the cures which had been thus effected before he met with Vanzetti's large work upon the subject. The plan adopted is to expose the affected limb, from May to August, to the rays of the sun, for a period of one to three weeks according to the duration and intensity of the pain, and for a period of several hours daily. Under this treatment the limb becomes brown, the exudations cease, and the part becomes better-nourished and capable of greater movement. (*Giorn. Ven. di Scienze Med.—Rundshau,* March, 1880.)

Treatment of Pleurisy in Children by Pilocarpin.—A paper on this subject by Dr. Vigier has recently appeared in the *Revue Theraputique Médico Chirurgicale.* The treatment which he describes has been tried with very decided success by Bouchut, who claims to have cut short the disease in its commencement in a number of instances. The first step is to relieve the pain in the side, for which purpose injections of morphia and wet cups are recommended. In order to prevent as far as possible the collection of fluid in the pleural cavity, a large dose of some emetic is administered. If this prove ineffectual, digitalis, squills, and the acetate or nitrate of potash are used. Diaphoretics are also to be employed, and of these he considers jaborandi to be the best. The infusion may be given in the daily dose of one to three grains. If the children refuse to take it on account of its disagreeable taste, the nitrate of pilocarpin may be given by hypodermic injection, in the dose of about one-seventh of a grain, morning and evening. This quantity will produce a prompt and abundant flow of sweat and saliva. Dr. Bouchut considers that this is a most efficacious plan of treatment. He condemns the use of blisters in the early stages of the disease, stating that they increase the congestion of the pleura; in the later stages, however, they may be useful to increase the activity of absorption when the means previously mentioned have been found insufficient. (*The Virginia Med. Monthly,* Jan. 1880.)

Physiological Effects of the Formiate of Soda.—M. Arloing reports the results of a series of experiments with this drug. When successive doses of a 20 per cent. solution are injected slowly into the veins of a dog or horse, the following phenomena on the part of the circulatory system are observed: after the first injections the heart beats more slowly, the capillaries of both the general and the pulmonary systems dilate, the arterial tension diminishes, and the diastolic or constant rapidity of the blood-current increases in the centrifugal vessels; when

the quantity introduced into the blood has become large, the heart's action becomes more rapid and the systole weaker. If a very large dose of the formiate be injected directly into the right ventricle, it causes retardation or even arrest of the heart's action. This arrest may be permanent; if not, the heart begins to beat again after a longer or shorter interval, according to the quantity of the formiate injected. After the action of the heart has been re-established, the symptoms are the same as after the injection of large doses. Small doses increase the number and depth of the respiratory movements. Moderate doses prolong expiration, and are sometimes followed by a series of short, rapid respiratory movements, separated from one another by a deep inspiration and a prolonged expiration. Large doses accelerate the respiratory movements and diminish their depth. A very large dose causes, immediately after the injection, a short arrest in expiration; the respiration is soon re-established, and is for a time exceedingly rapid, gradually increasing in depth. After twenty or thirty seconds these phenomena are replaced by a diminution in the rapidity and depth of the movements of the thorax, and by a tendency to pause during expiration. The formiate of soda is toxic when the dose exceeds 1 grm. for each kilogram (15 grs. to $2\frac{1}{5}$ lbs.) of its live weight of the animal. Death is ushered in by short inspirations separated by expiratory pauses, which rapidly grow shorter and shorter. The movements of the chest are arrested in expiration. The heart continues to beat for about fifty seconds after respiration has ceased, its pulsations gradually becoming slower and weaker. The formiate of soda lowers the animal temperature. In gradual poisoning, the temperature may fall 4·5° F. in an hour. This fall of temperature is due partly to the marked dilatation of the superficial capillaries, partly to the diminution in the depth of the respirations, and more especially to the modification of the pulmonary exchanges and the retardation of the organic combustion. When the expired. air was analysed during the action of the drug, it was found to contain less carbonic acid and more oxygen than under normal conditions, showing that the diminished elimination of carbonic acid by the lungs was accompanied by a diminished absorption of oxygen. When the gases of the arterial blood were analysed, both the carbonic acid and the oxygen were found to be diminished; hence, the diminished absorption of oxygen by the lungs was accompanied by a diminished production of carbonic acid in the tissues. The effects of the drug on the elimination of urea were not studied. It follows from the above that the formiate of soda must be classed among the defervescent remedies. It may, perhaps, prove useful in cases where the action of the salicylate of soda is distrusted, as it does not cause congestion of the kidneys, and

does not affect the heart as violently as the salicylate. (*Arch. Gén. de Méd*, November, 1879; *New York Med. Journ.*, Jan. 31, 1880.)

Action of Nitrite of Amyl upon the Urine, and its Use in the Treatment of Chronic Catarrh of the Bladder.—Dr. Weisser calls attention to the antiseptic properties of nitrite of amyl in regard to the urine, and showed before the society some urine which had been preserved since June, 1877, in a bottle, of which the cork had been saturated with nitrite of amyl. The urine was quite unaltered, of a fine yellow colour, and smelt distinctly of the amyl nitrite. Weisser also relates the case of a man, aged 60, who had suffered for four years from chronic catarrh of the bladder. Local injections of tepid water containing three drops of nitrite of amyl in $\frac{3}{10}$ litre of water were made twice a day by means of a Nélaton's catheter. Antispasmodics were given internally to allay the tenesmus. After six weeks of this treatment the man was relieved of the catarrh. (*Mitthlg. des Vereins Aerzte Steierm; Med.-chir. Rundschau*, March, 1880.)

Local Applications in Diphtheria.—Dr. McFalls after extensive experience in the treatment of diphtheria in both hospital and private practice has recently used Lugol's solution, thickened with tannic acid to the consistence of a thin cream, with better effects than any of the usual applications. He recommends that the mixture should be employed early in the disease, when the coating first makes its appearance. The tonsils on which the exudation is usually first seen should be well painted over, a large-sized camel's hair brush or a swab made of old linen being employed for the purpose. If the medicine is used at this period, even when the tonsils are considerably and much inflamed, the formation of the coating may be prevented, and the disease may be cut short. If the patient is not seen until the coating is extensive, the mixture should be applied over the exudation and over the parts adjacent, as far as they can be reached without difficulty. The frequency of application of the remedy depends entirely upon circumstances. If the coating in the throat has become very fine and thick the mixture should be applied three or more times in the twenty-four hours, and any new patches that may appear should also be painted. If the throat become sore, and deglutition be painful, a solution of carbolic acid may be applied with benefit, as a local anæsthetic. For the first three or four days cold compresses may be used externally. A cloth should be folded five or six thicknesses, of sufficient length to reach from one ear to the other; this should be wrung out of cold water and applied; over this a handkerchief may be tied upon the top of the head. In severe cases this should be changed every ten or fifteen minutes, or as often as it gets warm. As to

constitutional treatment, tincture of ferrichloride of potassium, quinine, and stimulants are principally relied upon. Dr. McFalls uses a strong solution of chlorate of potassium and the tincture of iron mixed together in simple syrup. Of this, in severe cases, a teaspoonful is given every half hour,—every hour in more moderate cases; the quinine every four hours, whisky in liberal quantities. Emetics and cathartics should not be given even at the commencement of the disease. After the onset of croupal cough zinc emetics have proved of great service. When the dyspnœa is very great and returns at intervals, much relief may be given by the use of bromide of potassium. (*The New York Med. Record,* Jan. 24, 1880.)

Clinical Study of Yellow Fever.—After carefully reviewing the recent literature of yellow fever, and more particularly that which has arisen out of the recent epidemic in the southern part of North America, the following conclusions have been arrived at: (1) Yellow fever is the sum of changes and effects produced in the human economy from the presence of a specific poison. (2) The specific nature of the poison is shown by (*a*) the inconvertibility of yellow fever with any other disease; by (*b*) the certain recognition of the disease through clinical histories found in its earliest records and down to the present time; by (*c*) the fact that it is portable from one place to another, and produces identically the same disease in places to which it has been carried. (3) The opinion that the poison is in its essential nature an organism finds support in the following facts: (*a*) it reproduces its kind in successive crops; (*b*) certain climatic conditions, as a suitable warmth and moisture, favour its development, while this is arrested by extreme heat or extreme cold. (4) It is reproduced chiefly, if not wholly, within the body, but undergoes some changes after its escape from the body which increases its toxic qualities. It possesses ponderability and some certain unknown quality which causes it to adhere to solid surfaces. On account of these characteristics of the "germ," the disease is seldom communicated from the persons of the sick, but it is generally contracted by visiting infected localities or by contact with infected things. (5) While yellow fever poison is an air-infecting agent, this quality is confined to limited areas. It is, therefore, wholly dependent upon human travel and commerce for propagation to any considerable distance from an infected place. (6) The atmosphere appears to be the medium of its introduction to the system, as no instance is on record showing it to have been received with food or drink. (7) Clinically considered, yellow fever is a self-limited disease of one paroxysm, and the blood deperdition due to the primary action of the poison is accomplished during this paroxysm. (8) As the

disease cannot be intercepted, or jugulated, or cured by antidotal or eliminative treatment, its therapeusis is limited to those medicines which are useful in controlling symptoms. (9) The only safe prophylaxis is to keep unprotected persons out of the range of infection, either of localities or things, (*a*) by a rational system of quarantine, (*b*) by a careful isolation of the sick, (*c*) by cleansing and disinfecting all localities and fomites. (*The American Journal of Med. Sci*, April, 1880.)

Gout.—M. Delaunay applying to pathology that method which has already been employed in anatomy and physiology, has studied gout in regard to all those biological circumstances which increase or lessen nutrition. The conclusion at which he has arrived is that gout attacks those individuals and those parts which are best nourished and which are most highly developed: the higher races, men, adults, the strong, the right side, the apparatus and organs of animal life. It acts therefore in direct proportion to the nutrition · being greater (acute) when the nutrition is greater, and less intense (chronic) when the nutrition is less intense. As a further proof that it bears a direct relation to nutrition, he shows that it is caused and increased by all those physiological phenomena which increase the nutritive functions such as excess of food, stimulants, amenorrhœa, the menopause, &c.; on the other hand, gout is prevented or diminished by every thing which tends to lessen nutrition: scanty food, menstruation, rest, spring, warm climates, and elevated positions Similarly, maladies which lessen the nutritive powers, such as flux, diarrhœa, piles, &c., tend to lessen gout. M. Delaunay explains the phenomena of metastasis and metabolism, on the theory that individual causes which tend to displace the blood also tend to alter the position of the affection. Lastly, the antagonism which is shown to exist between gout and tubercle, is explained when it is remembered that phthisical patients are feeble, and that gouty persons are exempt from phthisis because they are strong. (*Le Progrès médical,* May 8, 1880.)

Treatment of Inguinal Bubo.—Dr. J. Mullé gives the following rules as the result of a special study of bubo. In the case of simple non-virulent bubo, the treatment will depend upon the stage at which the affection has arrived. (*a*) In the first stage, absolute rest in bed, poultices and rubbing with a mercury and belladonna ointment are to be employed. (*b*) In the second stage, *i.e.* in that which is characterised by redness and adhesion of the skin, blisters may be used with caution, and they may be repeated if suppuration does not show itself. If in spite of the blistering suppuration should occur, incisions may

be made. (*c*) In the third stage, viz., that of suppuration, incisions should be made. If the abscess be small, the incisions should also be small, compression by means of collodion should be exercised over the rest of the swelling, and the edges of the wound should be kept apart. In cases where there is extensive suppuration the incision should be large, cicatrisation should be so managed as to prevent the formation of disfiguring and hurtful scars. The chancrous bubo should be treated by poulticing, incision when pus has formed, slight pressure, and if necessary, injection with nitrate of silver. In doubtful cases, treat as for chancrous bubo. (*Thèse de Paris,* No. 409, 1879; *The Glasgow Med. Journal,* April, 1880.)

On Catching Cold.—Dr. Lassar has attempted, by experiments upon animals, to determine the physiological effects of catching cold. By means of hydrated calcium sulphite he removed the hair from rabbits, an operation which does no harm so long as they are kept in a warm room, although if they be exposed to cold the same consequences follow as if the skin were varnished over. After watching the condition of the animals and observing their urinary secretion for some days at a temperature of about twenty degrees centigrade, he found that little change took place if the temperature were kept for fifteen to twenty hours at thirty-four or thirty-five degrees centigrade, excepting that the temperature of the animal rose from about a half to one degree, again falling when the animal was once more put under normal conditions. The result was very different, however, when a rabbit deprived of its hair was suddenly taken out of a warm room and held up to the neck for one to three minutes in ice-cold water. The temperature in the rectum always sank more or less after this proceeding, according to the duration of the immersion, and sometimes fell as low as thirty-two degrees centigrade. After the animal had been carefully dried, rubbed, and placed in the heat of the sun or of a stove, it continued to shiver, sometimes for hours, but if it was put in an atmosphere of about twenty degrees centigrade, it recovered and soon after was apparently all right. Violent but transitory diarrhœa occasionally occurs. One of the most remarkable results, however, is that after one or two days albumen almost invariably appears in the urine and is accompanied by hyaline tube casts. The quantity of albumen is at first very small, afterwards becomes greater, and may become very large, at the same time the temperature rises, so that in the rectum it may be one to five degrees centigrade above the normal. In many cases the albuminuria only lasts a few days, then diminishes, and finally disappears. Sometimes, however, it continues for weeks, or even months, up to the death of the animal. Whenever the

animal that has recovered from albuminuria is again exposed to cold, the albuminuria reappears. Microscopic examination of the organs in which no peculiarity could be observed by the naked eye constantly showed the results of the chill in interstitial inflammation, especially in the kidneys and liver, but also in the lungs, heart, and sheaths of the nerves. With the exception of a slight artificial eczema on one occasion, the skin was never affected in the least. The muscles sometimes showed an abnormally red colour, but there was no increase of the nuclei nor of those of the sarcolemma.

The joints in all cases were absolutely unaffected, a circumstance which supports the Senator's distinction between muscular and articular rheumatism. With the exception of a slight fatty condition, which did not overstep the normal limit, the parenchyma of the inflamed organs was unaltered, but on the other hand, the vessels, especially in the lungs and liver, were often enormously dilated, the arteries filled with thrombi, and in the neighbourhood of the veins, as well as in the connective tissue interspaces, leucocytes had wandered out of the vessels in great numbers. On repeating the experiments with rabbits from which the hair had not been removed, similar results were obtained, as well as with young puppies, and even with frogs. When pregnant rabbits were used for experiments, inflammatory changes could be observed by the microscope, although not with the naked eye, in the liver of the fœtus, as well as of the mother. These inflammatory changes in the adult animal were chiefly round the vessels, and the author believes that they are due to the blood, which has been suddenly cooled in the skin, returning to the internal organs, and there acting as an irritant. (*Virchow's Archiv.* Band 79, Heft. 1.)

Inflammation of the Auditory Meatus.—Dr. Buck sums up the relative merits of the different measures most commonly employed in the treatment of acute circumscribed inflammation of the external auditory canal, including furmicles, as follows: "Incisions cannot be depended upon to give permanent relief from pain, or to materially shorten the course of the disease. They should therefore be only used after local blood-letting or hot applications have been faithfully tried without success, or where the appearance of the inflamed part indicates the probable formation of a collection of pus. The application of heat is preferable to local blood-letting by leeches. Of the various means at our command for applying heat to the inflamed part, the pleasantest, and at the same time the most effective, is the hot douche. In a few cases, however, the patient finds some form of dry heat more effective in relieving the pain." (*The American Journal of Otology*, Jan. 1880.)

Primary acute Purulent Inflammation of the Middle Ear.—Dr. H. Knapp, of New York, makes the following suggestions respecting the causes and treatment of this disease: Amongst causes, exposure to cold furnished nearly 64 per cent. of his cases, from extension to the middle ear of inflammation originating in the naso-pharyngeal mucous membrane. *Sea-bathing* follows with about 9 per cent. The low temperature of the sea water entering the meatus, the large proportion of salt contained in it, its contamination with sand, slime, small plants and animals, and lastly the great loss of heat to the entire body to which the bather is subjected, are amongst the reasons given to account for the occurrence. Next follows scarlet fever, with about 7 per cent.; diphtheria 2 per cent.; measles and pneumonia 1¼ per cent. Discharge from the ear, corresponding with perforation of the drum head, begins usually in from two to three days from the exposure, but may be delayed till the seventh or fourteenth day. Respecting treatment Dr. Knapp insists strongly on the necessity of rest in bed from the first, to secure perfect restoration. If otorrhœa have not set in 2-6 leeches should be applied behind the ear and hot water be poured into it at intervals; aperients to be given. After discharge has set in, should it suddenly cease, which means a more intense return of inflammation, accompanied with pain, fever and vertigo, steaming the ear is most effectual. Should this not succeed, Wilde's incision over the mastoid must be practised. The naso-pharyngeal membrane and Eustachian tubes should receive constant attention. Astringent solutions (arg. nit., alum tannin, sulphate of zinc 1-3 per cent.) are to be used as gargles, nose waters, or by the nebuliser or posterior syringe. Politzer's process should always be employed, also careful syringing of the meatus with lukewarm water containing sodæ carb. to keep the external canal perfectly clean. Later on weak astringents. Polypoid granulations are thus prevented. (*Archives of Otology*, May, 1879.)

Notes and Queries.

On Large Doses of Morphia Hypodermically.—We have received the following communication on this subject from Dr. Heywood Smith:—"The tolerance of morphia can be carried far beyond the quantities given in the cases brought forward by Mr. Robert Park in the *Practitioner* for June. In 1872 I had a patient, aged sixty-six, who had had nine children and one miscarriage (the last pregnancy being twenty-five years previously), who was the subject of a rather rare form of malignant ulcer of the cervix uteri, more like lupus. She had been ailing five to six years, and latterly suffered very severe pain. I used often to inject her three times a day with six grains of morphia at each injection, and one day I gave her four such injections, making twenty-four grains in twenty-four hours. This just relieved the pain and did not produce much sleep. Her tongue remained for a long time quite clean, and her appetite fair."

Chrisma.—We have received from Messrs. Allen and Hanbury a substance bearing this name, and intended as a basis for ointments. It is of a light primrose colour, devoid of smell and taste, and consists of a solid hydrocarbon obtained from petroleum. In its properties it resembles very closely Vaseline and other substances of the same class. Like them it cannot become rancid, and it forms a much better basis for many ointments than fat or oil, and may also be used pure as a substitute for simple ointment or glycerine.

Self-Raising Flour —In this flour, a specimen of which we have received from Messrs. Macdougall and Co, the power of raising the bread or pastry by the evolution of gas during baking is conferred by the presence of acid phosphates instead of by acids or by fermentation. As phosphates play a considerable part in the nutritive processes of the body, their presence is likely to be useful rather than injurious. We have satisfied ourselves that the flour is most useful for making pastry; indeed it rises so well that with it light pastry is made by cooks whose pastry is so heavy as to be uneatable when made with ordinary flour.

Bibliography.

Montreal General Hospital Reports, Clinical and Pathological by the Medical Staff. Edited by William Osler, M.D., M.R.C.P. Lond. Vol. I. 8vo. pp. 369. Montreal: Dawson Brothers.

On Consumption, and its Treatment by the Hypophosphites. By John C. Thorowgood, M.D. Third edition. 8vo. pp. 88. London: Baillière, Tindall, and Cox.

Notes on the Diseases of the Testis. By Samuel Osborn, F.R.C.S. Fcap. 8vo. pp. 117, with engravings. 3*s.* 6*d.* London: Churchill.

An Elementary Treatise on Practical Chemistry and Qualitative Inorganic Analysis. Third edition. By Frank Clowes, D.Sc., London. Post 8vo. pp. 353, 48 engravings. 7*s.* 6*d.* London: Churchill.

A Clinical Lecture on Absorbent and Antiseptic Surgical Dressings. By Sampson Gamgee, F.R.S.E. 8vo. pp. 18, with engravings. 1*s.* London: Churchill.

Indigestion: What it is, What it Leads to, and a New Method of Treating it. By J. B. Gill, M.D. Fcap. 8vo. pp. 249. 3*s.* 6*d.* London: Churchill.

Surgical Emergencies. Third edition. By W. P. Swain, F.R.C.S. Crown 8vo. pp. 220, 117 engravings. 5*s.* London: Churchill.

Department of Public Health.

EFFLUVIUM NUISANCES.[1]

Now that Dr. Ballard has brought his series of "Reports upon Trade Nuisances" to a conclusion, we are in a position to speak upon them as a whole and to estimate their value to the practical hygienist.

First we would say that they contain a description of a large number of trade processes, as they are carried on and have been seen carried on in the various establishments visited by the author, such details only being given as have appeared necessary for the full comprehension of what he had subsequently to say about them. Yet such details are never wanting. Here is one element of special value to medical men as contradistinguished from manufacturers. The reader is told exactly what he is likely to see going on at any works he may have occasion to deal with officially, and is spared the tiresome perusal of what, to him, is the irrelevant matter that he would have to wade through if he sought this kind of information from the ordinary works of Technology. The descriptions given by Dr. Ballard are not derived from books, but from actual observation of actual working of the trades; and their accuracy may be relied upon for this, among other reasons, that they have in all the most important trades been checked and corrected by the most distinguished manufacturers.

[1] *Eighth Annual Report of the Local Government Board*, 1878–79.—Supplement containing the "Report of the Medical Officer for 1878." Appendix, "Report by Dr. Ballard on the Effluvium Nuisances arising in connection with various Manufacturing and other branches of Industry."

Secondly, we are told what becomes of the "refuse" of trade processes, such refuse matters being traced on from hand to hand until the last useful product has been extracted from them, and the final "refuse" has become "refuse" indeed. We do not know any other source from which information of this kind is derivable without the expenditure of much laborious research. And the value of it lies in this, that very often it is not the trade process itself that gives rise to complaints of nuisance or to the principal complaints of nuisance, but the accumulation of refuse matters which undergo, sometimes spontaneously, chemical changes that cause the emission of offensive effluvia. There are some trade processes which give occasion to no nuisance at all, except perhaps a smoke-nuisance, but in which great nuisance is apt to arise from the refuse of the processes. Such, for example, are coal-mining and the working of iron, and in such instances as these Dr. Ballard passes over the primary processes and confines himself to the consideration of the accumulated *débris*. Speaking of refuse, one of the most interesting and novel chapters of the reports is that in which the waste heaps of alkali works are described and dealt with.

Thirdly, the nuisance arising from each trade process is described, and the conditions which modify it are pointed out, either in general terms applicable to all this class of nuisances, or as respects individual trades. Under each trade the source or sources of its offensiveness are pointed out fully, so that an officer of health investigating a nuisance and having these reports in his hand may, after mastering the details of the business, spot without difficulty the precise element in the process before him that demands his special observation.

Fourthly, there is the question of injury inflicted, or liable to be inflicted, upon the health of the public by the effluvia proceeding from trade and manufacturing processes. And this is the part of Dr. Ballard's work to which we as medical men shall all turn with the greatest interest. Trade effluvia may be nasty, difficult on this account to be put up with, and they may render our lives a misery rather than a comfort where their offensiveness is great. But what we all want to know is whether they

are injurious to the health of persons exposed to them, and if they are so, to what extent and in what way. These are questions which Doctor Ballard set himself to answer, and if his reply be not as complete and as satisfactory as might be desired, its deficiencies are attributable not to any failure on his part to avail himself of all the means of investigation at his hand, but to the inherent difficulties of the task, which for its complete accomplishment would require many life-times rolled into one, and a minuteness of etiological discrimination which the circumstances of the inquiry prohibited. The Medical Officer of the Local Government Board, commenting upon these reports, thus sums up and expresses the general result of Dr. Ballard's inquiries under this head. He says:—

"There are first a variety of influences upon health exerted by offensive trade processes which have the speciality of being not offensive only, but concerned with definably infectious materials, or with poisonous materials in quantity, and are thus specifically infectious or poisonous to workers or to neighbours. Thus danger from infective matter arises in the case of trades that deal with old wearing apparel and with foul house-refuse. So again (to take an instance where the offence was a matter of second rank) the manipulation of horse-hair infected with the contagium of anthrax has been found to be attended with serious and specific risks. For an important and elaborate communication on this particular subject, referring some recent occurrences in Glasgow to the dealing with infective Siberian horse-hair, the Department is indebted to Dr. Russell, the Health Officer of that city. Dangers of this sort are, as may be readily understood, apt to be limited, in the first instance, at all events, pretty strictly to the persons of actual workers in the offensive material, but circumstances of conveyance, delivery, and storage may cause them to be operative beyond the immediate area of the trade premises. In a second sort of trade processes, again, inorganic vapours and gases acknowledgedly poisonous were given off in quantity, in a way to produce their special poisonous phenomena; and this sort of influence was found to be manifested in a notable degreee outside the works at which the effluvia were given off. This was the case with arsenical vapours given off from galvanising works; with metallic fumes from the melting up of old brass; and (again to take a case where the offence was not from the actually poisonous substance, but from something associated with it) with carbonic oxide gas from lime-kilns. Leaving these two sorts of offensive businesses where there is some major evil influence apart from simple offences, the bulk of Dr. Ballard's report is concerned with trades and trade processes in which offence of one kind or another is the prominent feature. In these he recognises several sorts of influence upon health:—

"(1) There is first the influence of stink as stink; an influence found to be common to offensive businesses as such, and independent of the nature of the material or process causing the offence. This influence consists in a group of symptoms of singular constancy representing a disturbance of digestive and circulating functions along with and probably due to a number of sensory disturbances—loss of appetite, nausea, sometimes actual vomiting, sometimes

diarrhœa, headache, giddiness, faintness, and a general sense of depression or malaise. It is an influence from which some individuals suffer more than others, and to which some persons become more sensitive, while others become less sensitive, with custom and time, an influence from which people, who from any other cause are sickly, are particularly liable to suffer, and even to suffer to a serious degree.

"(2) Then, there is another influence of certain trade effluvia of various kinds and of various degrees of offensiveness, that consists in their exerting an acrid irritating effect on the surfaces of the body. The vapours of acids, the products of destructive distillation of oils and fats, are types of these effluvia To workers in factories where they are produced they are a source of serious distress or discomfort to eyes, throat, and air-tubes, and even to the skin; while to dwellers in the neighbourhood they occasion in a less degree irritation to any exposed mucous membrane.

"(3) It is after arriving at this point by a succession of cautious steps that Dr. Ballard would proceed to consider the effect of offensive trades in producing definite disease and in actually shortening life: and it is here that he begins to regret his inability to apply the usual methods of differential inquiry, by means of statistics of disease and death, into the influence of one and another disease-producing condition. Of effect upon comfort and ease of life he has sufficient assurance in the case of a variety of trade processes; but when he passes on to consider the evidence respecting further and more serious effects upon health and life, whether among workers or neighbours, he finds himself in want of the usual means of demonstrating relation between observed disease and the offensive trade as the cause of it. Trade influences proper are found not to be capable of differentiation from influences incidental to place of work, or even from others independent of trade altogether. Given, for example, continued respiration, in the neighbourhood of offensive works, of an atmosphere moderately charged with sulphuretted hydrogen, and an observed depression of general health with some nervous disturbance in persons exposed; other circumstances, such as conditions of lodgment and diet, would have to be taken into account before the offensive gas and the failing health could be connected as cause and effect: and it was not possible so to extend the inquiry, even if needful data had existed, as to take account of these things. Yet suggestions of the reality of such connection were in this instance not lacking, even in such limited investigation as was practicable. Of like nature was an appearance of injury to health from the offensive effluvia from the tank waste of alkali works, especially where waste acid was permitted to mix with the drainage from the waste. So the organs of respiration appeared to suffer (as mentioned in the preceding section) where acid vapours were largely diffused in the atmosphere, but it was by no means clear that any definite form of disease was produced by those vapours acting by themselves only. About the mischief that was done by them to people already subject to chest complaints there was no doubt, and one of the most common observations in the neighbourhood of those many works from which acid vapours are given off was the aggravation of suffering experienced by people with delicate chests. Of the popular belief that acid gases have conversely some power for good in preventing infectious disease from spreading within the range of their influence, Dr. Ballard finds no evidence whatever.—The report teaches, indeed, that the presence of an offensive business, though it may not rank in the infective or poisonous class, yet deserves to be rated along with and prominent among those conditions that cause one place to be less wholesome than another place. At present it may not be possible to affirm the extent or nature of the share which the business has in the

production of the total result, but further progress towards this knowledge may be expected from among the various sanitary observers whom Dr. Ballard has interested in his inquiry."

Dr. Ballard points out the methods of abatement of trade nuisances, and here the Medical Officer of the Board remarks that "the report leads to a quite satisfactory result." It was to this branch of the subject that we devoted some observations last year (See *Practitioner*, vol. xxii. p. 237); so there is no occasion for us to pursue it now. It may suffice to say that Dr. Ballard distinguishes methods of abatement which have been tried and found successful from such as are mere suggestions which have yet to be tested and improved upon by experience.

One word as to the scope of the inquiry now brought to a close It has travelled over a range of some seventy different kinds of businesses, from the keeping and slaughtering of animals to the smelting of ore and the refining of metals; and Dr. Ballard tells us that in the progress of the inquiry he visited and investigated the details of work in above 850 separate trade establishments distributed over nearly all parts of England and Wales and a few of them in Scotland and Ireland. The first two reports were devoted to the businesses dealing with animal, and animal and vegetable substances chiefly; the last report (recently issued) treats mainly of businesses in which mineral substances are dealt with (such as brick-burning, pottery-making, and the chemical trades generally), but it includes also the dealing with town refuse and other businesses which Dr. Ballard found a practical difficulty in classifying.

The last few pages are not by any means the least valuable part of the report, since in some "Incidental Remarks on the Difficulties experienced by Local Authorities in dealing with Offensive Businesses" Dr. Ballard draws upon his own large experience when Medical Officer of Health for Islington, as well as availing himself of knowledge derived during the inquiry he had in hand. Some of these difficulties have arisen from ignorance such as this report is calculated to dispel, others from oversights in legislation due to its piecemeal character, and others to misapprehension by Medical Officers of Health of the meaning of the term "a nuisance or injurious to health" used

in the Public Health Acts. He shows how the most recent judicial utterances tried to dispel doubt and misapprehension upon this last subject, and to clear the way for the conscientious health officer when called upon to give in the terms of the statute the certificate which will enable the Local Authority to take action for the abatement of a trade-nuisance.

Let us hope that the time is not far distant when the information contained in these unique reports and now inconveniently distributed through three Blue Books, one of which is already out of print, will be collected into one useful volume under the auspices of the Board which Dr. Ballard serves.

ANIMAL VACCINATION IN THIS COUNTRY.

On the 11th of June, in the House of Commons, the President of the Local Government Board, Mr Dodson, stated on behalf of his department that they were willing to make arrangements for the supply of animal vaccine lymph (as well as humanised vaccine lymph) as stock, from the Natural Vaccine Institution, to such medical men as might require it. This statement will mark the beginning of a new era in the history of vaccination in this country.

The question arose in the House on a motion of Dr. Cameron's which was worded as follows:—"That as cowpock lymph direct from the calf, commonly known as animal vaccine, is of at least equal value as a prophylactic against small-pox with the ordinary humanised lymph, and as its use affords an absolute guarantee against the propagation of those human diseases occasionally invaccinated with humanised lymph, this House is of opinion that to meet the objections to vaccination founded on the possible communication of other disease through that operation, a supply of animal vaccine should be provided by the Natural Vaccine Establishment for the use of those who prefer it to ordinary lymph." Dr. Cameron supported his motion in a speech which contained much doubtful argument, and which gave an undue and misleading prominence to certain evils which might possibly attach to vaccination as ordinarily performed

with humanised lymph. But avoiding the difficulties which beset the Bill he had introduced at the beginning of the Session (as also in the previous Session of Parliament), and allowing this to drop, he took up a position which was irresistible, and he has had his reward. The Local Government Board could not well do other than meet Dr. Cameron on the ground he had now selected, and he further facilitated a present settlement of the question by judiciously accepting the more restricted terms of supply of animal vaccine lymph proposed by Mr. Dodson, in place of those he had suggested in his motion. The Local Government Board, under the circumstances, could hardly have promised less in the matter; but in a subject which will be new to them in practice, and of which the influence upon existing arrangements for vaccination—arrangements which it is generally conceded must be pursued at all hazards, if our system of vaccination is to be maintained in an efficient state—cannot be foreseen, it would not have been desirable to require more We feel no doubt as to the success of the experiment which the Local Government Board has now consented to undertake. Time will be required for completing the arrangements for entering upon it, but once entered upon we do not think that Dr. Cameron will have cause for regret that he left the future development of the matter in the hands of the Local Government Board. The medical department of that Board—with whom must rest the responsibility of introducing and carrying out the new work to be given to the National Vaccine Establishment, whatever opinion may be held of their views in the first instance as to the merits of animal vaccination with reference to the requirements of compulsory vaccination in England, and the relative value of animal and humanised vaccine lymphs—will, we may be assured, enter upon the additional duty which now has to be undertaken by them with that conscientious care for its thorough performance which is a characteristic of the work of that department.

An amendment to Dr. Cameron's motion was proposed by Mr. P. A. Taylor, to the effect that it was inexpedient and unjust to enforce vaccination under penalties upon those who regarded it as undesirable or dangerous; Mr. Samuelson had a motion on the notice paper for the evening in favour of a further inquiry

as to the value and efficacy of vaccination as a prophylactic of small-pox. But this motion was withdrawn, and Mr. Taylor's motion was negatived without a division. Dr. Cameron also withdrew his motion after hearing Mr. Dodson's statement.

ENTERIC FEVER IN INDIA:—THE EPIDEMIOLOGICAL SOCIETY.

SINCE Sir Joseph Fayrer, M.D., K.C.S.I., accepted the Presidency of the Epidemiological Society at the beginning of the session which has just ended, certain epidemiological questions, particularly relating to India and tropical and sub-tropical climates, have, as was anticipated, assumed unusual prominence in the proceedings of the Society. Questions which hitherto have been largely regarded here, if not with indifference, at most with the languid interest which too often besets the consideration of matters occurring in far distant places with which the majority of home workers are unfamiliar, and which had to be mastered (if mastered at all) in bulky reports and official papers—suddenly, so to speak, have been given a degree of interest equal to any of the various questions which most occupy the attention of the profession, by the appearance in the Epidemiological Society of several of our Indian brethren whose names have been associated with the questions referred to, and who, by their presence, have, as it were, vitalised them in this country. Dr. Norman Chevers, Surgeon-General Dr. Gordon, C.B., Deputy Surgeon-General Ewart, and Surgeon-Major Don, each have contributed papers to the Society during the past session on the continued fevers of tropical and sub-tropical climates. The chief interest of these papers naturally centred on the views entertained in India as to "enteric fever," so called, a question which has been for some short time, and still continues to be, a subject of vehement discussion among our Indian brethren. Two aspects of the question, and the two sides of the discussion, as it is maintained in India, were represented respectively by Dr. Ewart and Dr. Gordon, and home-staying epidemiologists had the

opportunity of hearing from these distinguished medical officers the exposition of their several views; while, on the other hand, those gentlemen had the opportunity of learning the impression made upon certain of our most familiarly known epidemiologists by the exposition of their views. The interest almost solely rested in the opinions expressed by Dr. Gordon, whose recent reports on typhoid or enteric fever in relation to British troops in the Madras command, have exercised greatly the minds of the profession in India, and, to a certain extent, the minds of those at home who give attention to medical polemics in our great dependency. The Epidemiological Society determined to submit the several papers which had been submitted to them touching enteric fever in the tropics to special discussion, and the Society met for this purpose on the 15th of June under circumstances of weather which unfortunately kept away all but the most enthusiastic members. The discussion concerned itself almost wholly with Dr. Gordon's paper, for Dr. Ewart in his large personal study of the disease finds the enteric fever of India, in its symptomology, anatomical appearances, and etiological relations, to follow precisely the same course and exhibit the same habits as in England, hence his conclusions present little for observation from the European point of view. It is far otherwise with Dr. Gordon's observations.

The president (Sir Joseph Fayrer), Surgeon-General Dr. John Murray, Sir William Smart, M.D., K.C.B., Inspector-General Lawson, Surgeon-Major White, Dr. Walter Dickson, Dr. Buchanan (the Medical Officer of the Local Government Board), and Mr. Netten Radcliffe took part in the discussion. We propose to limit our observations to the remarks of the two last-named gentlemen, for it is matter of great scientific interest to know how Dr. Gordon's conclusions, as detailed and supported by himself, presented themselves to the minds of two English observers habituated to etiological inquiries, and accustomed to deal with complicated questions of the sort raised by Dr. Gordon.

Dr. Buchanan observed that he could only profess to look at the subject of Indian fevers by the light of experience gained in the study of continued fevers in England. Referring to the papers specially under discussion, he pointed out that attempts seemed to be made to identify a disease, now by means of some anatomical character, now by means of clinical symptoms, or

thirdly, by an appeal to considerations of cause. The last means of identifying disease appeared to him questionable. In England we were content to know enteric fever by the total of its symptoms and pathological appearances; and to proceed from that standpoint to the investigation of cause. We had long known the clinical disease, and had not yet become fully acquainted with the circumstances of its production. Given a continued fever, with more or less diarrhœa and spleen enlargement, with special characters of temperature curves, with successive crops of rose spots on the skin and with certain anatomical characters in the fatal cases, we have known it as enteric fever. In England, having come to know our disease, and not till then, we have gone on to learn lessons about its association with one and another external condition, and then by degrees we were learning of its causation. But the numerous and valuable results that inquiries about causation had heretofore yielded did not prevent our having, rather let us have, ever fresh doubts whether we know all the conditions for the appearance of the disease, and assuredly had taught us that we did not yet know the conditions for its production. Inquiry as to the way in which fever had made its appearance in a household—to say nothing of inquiry, in a stricter sense, as to "cause"—had been found to involve a process of living over again, as it were, the life of each patient before his attack, with differentiation of his life from that of other people. That process was difficult enough of accomplishment under the conditions of English society, but must needs be incomparably more difficult when a fever occurred in individuals of an alien race, having traditions and caste notions separating them by wide intervals from the people who were endeavouring to investigate the origin and spread of disease among them. The impression which he had reached from a study of the papers was, that it was perfectly permissible to regard much of the described fever of India as being identical with European "enteric fever." It was modified, no doubt, by circumstances of Indian life, yet did not appear to differ more from our own enteric fever than one case or one outbreak might differ from another case or another outbreak of this multiform disease when it was witnessed in Europe. It was not from any single one of the papers that he had formed this opinion, but it was

essentially from observation of what the papers, taken together, appeared to him to agree upon.

Mr. Netten Radcliffe limited his observations to Dr. Gordon's paper, and to the reports on which that paper was founded. He observed that he felt some difficulty in entering upon their consideration, on account of the multiplication of details in them, which made it necessary to exclude from discussion numerous points which the author might deem necessary to a right understanding of the whole. The time at the disposal of the meeting left, however, no choice but to confine the attention to two or three points only, and he proposed to devote his attention to Dr. Gordon's conclusion, that " a form of fever like what in Europe is called typhoid, except in etiology, exists in India and other hot countries; that in them such a fever is due to climatic influences, not to filth or other specific causes; that all attempts made to trace any of 175 cases recorded to such causes have been unsuccessfully made." Mr. Radcliffe reviewed this conclusion from the point of view of the nature of the inquiry which had led to it, and the nature of the evidence on which it rested. Dr. Gordon had, according to his paper and reports, conducted the inquiry obviously from the point of view that it was doubtful whether the distinction of enteric fever as a separate and specific form of fever, as maintained in Europe, could be maintained; and implying that continued fever was a unity manifested in several varieties; and he had quoted approvingly the writings of several authorities in support of these views. Mr. Radcliffe animadverted upon the promiscuous character of these quotations, illustrating his remarks by taking the one most insisted upon, and showing that it was written by the most honoured physician in England some time before the great discrimination of Stewart, Jenner, and others had been made—a discrimination fully accepted by the distinguished writer at the present time—and referred to a growing habit among teachers who then believed in the unity of continued fevers, to multiply varieties. Mr. Radcliffe pointed out that the quotation particularly pointed to a habit conspicuous in Dr. Gordon's report, who, while writing of the continued fevers of India as a single disease, described not less than *twelve* varieties in 175 cases ! Dr. Gordon's inquiry, such as it was, appeared to him not to be directed to the elucidation

of the fact whether "enteric fever," as understood by European physicians, existed in India, but to get together "views," "opinions," and certain data which tended to show that the continued fevers of India constituted *one* disease presenting several varieties: to show reasons for reverting indeed to the doctrine of "continued fever," which was held before Stewart and Jenner wrote. He was concerned solely with pointing out the light in which that part of Dr. Gordon's work appeared to him, and had no purpose to discuss the question, whether it was a retrograde view or otherwise. And as to the form the inquiry took, it was carried out by a *circular* letter of queries, issued generally to the medical officers in the Madras command. The inquiry was carried out under the assumption that the years of labour which had been devoted to the *personal* investigation of the subject of enteric fever, by the great teachers in Europe and America, would be sufficiently represented *in India* by a series of formal returns filled up indiscriminately! Next, as to the value of the returns so made, in view of the inquiry, according to Dr. Gordon's estimate. The returns related to 175 cases which had occurred within a period of thirteen years among British troops scattered over the whole area of the Madras Presidency. Of these cases *seven only*, Dr. Gordon held, could be accepted as cases of true specific enteric fever, the remaining being examples of (1) endemic continued fever; (2) continued fever of adynamic type, non-specific; (3) febricula; (4) ardent fever; (5) endemic remittent; (6) fever of uncertain type; (7) continued fever; (8) typho-malarial fever; (9) remittent; and (10) malarial endemic. Nevertheless Dr. Gordon does not hesitate to use the whole of the 175 cases as furnishing evidence to decide the question of the relation of "enteric fever" in India to "filth or other specific causes." Mr. Radcliffe was not prepared to receive the evidence of persons upon questions touching the etiology of a disease who, according to Dr. Gordon's showing, were unable to diagnose the disease; neither was he prepared to set aside so summarily as Dr. Gordon had done such diagnosis as they had made. He would accept for the moment the diagnosis of the reporters and the information they had given upon it, as at least of the same value as the information which would have been given by a similar number of practitioners at home, taken indiscriminately

and addressed by circular. What followed? (raising no questions as to the value of the questions put for eliciting the information needed, and taking the answers as they are given,) Dr. Gordon's data show that the statements made as to twenty-five per cent. of the 175 cases recorded yield no information whatever. Deducting these cases from the total number, 53·5 per cent. show that the patients had been exposed to fæcal effluvium from latrines, to the filth in and about native dwellings, and to liabilities to infection; and 46·4 per cent. only are returned as affording no evidence as to exposure to emanations from filth, from infection, or from other sources likely to foster or produce the disease. Mr Radcliffe observed that he was quite unable to reconcile these data with Dr. Gordon's statement; "that all attempts made to trace any of the 175 cases recorded to such causes (*i e.* filth or other specific causes), have been unsuccessfully made." Mr. Radcliffe took exception to Dr. Gordon's loose use of the words "causation," "filth," and "climate," and stated, illustrating the European use of the word "climate," that a definition which made that word, as Dr. Gordon makes it, synonymous with "malaria," ("the expression malaria can only be accepted as a synonym of climatic influences;" "malaria is in these respects employed as synonymous with endemic and climatorial influences;") passed his apprehension.

The scientific value of Dr. Gordon's report, so far as "enteric fever" in India is concerned, may be taken to be illustrated by the fact upon which Mr. Radcliffe dwelt, namely, that according to the author's own showing it rested upon *seven cases* occurring at intervals in the course of several years over the vast area of the Madras Presidency! We refrain from comment.

THE PRACTITIONER.

AUGUST, 1880.

Original Communications.

A SUMMER IN ITALY.

BY DAVID YOUNG, M.D., FLORENCE.

"A WINTER in Italy" would be an easy theme for a physician who had spent many of the best years of his life in this classic land, whether he sought to sketch for the traveller, in search of repose in healthful recreation, some of those histories which circle round almost every city in the peninsula; or whether he wrote more especially for those whose numbers increase from year to year, and who migrate southwards, as the autumn in the north sets in, seeking a refuge from the approaching winter, and to whom a sheltered sunny spot where they can enjoy life in the open air during all the winter months is of more importance than all the histories of bygone days, or the "treasures of art" which tempt so many to leave their homes. Winter in Italy has been described in all its aspects, and the many thousands who annually sojourn amongst us have nothing to desire in the way of information as to what they should see and where they ought to go. Winter stations are springing into notice everywhere—from Bordighera and Alassio in the north to Capri and Salerno in the south. It is otherwise, however, with summer quarters, and with the exception of the Baths of Lucca, lying between Pistoia and Pisa, there is scarcely a spot in Italy which has, until recently, been known to strangers as suitable for a summer residence. Of all the thousands who *winter* in

Italy only a very few remain during the summer, and this not from unwillingness to do so, but from ignorance of the localities which are now found to be so admirably adapted for a summer sojourn. My friend Dr. Macpherson, in his excellent book on the *Baths and Wells of Europe*, says, "The Apennines scarcely afford any summer retreats cool enough for the English." This has certainly been the prevailing belief hitherto, and ever since taking up my residence in Florence the question as to where invalids and others should pass the summer has been one of the greatest difficulties I have met with in the discharge of my professional duties. The opinion of the physician on this matter is asked hundreds of times in the course of the spring and early summer, and as it is an absolute necessity that the majority, at least of invalids and visitors, should quit our large cities during the summer months, it becomes a subject of the greatest importance to our fellow-countrymen and others, who may happen to spend the winter in Italy and desire to return the following year, but who are at the same time anxious to avoid the fatigue of a long journey to Switzerland, for the intervening summer months. It would be an easy thing to find pleasant spots enough out of Italy if distance and expense were no items in the case, but when one or both must be taken into serious consideration, the deservedly popular summer resorts north of the Alps are too frequently out of reach. But apart from the question of economy, a summer residence in Italy for those who have spent one winter and wish to spend another, and especially for those affected with disease of the chest, is of greater value than is generally understood. When speaking of the climate of Abetone I will again refer to this subject.

As compared with Switzerland, Germany, and Austria, it has hitherto been believed that Italy had almost no cool summer resorts whatever. The reason why Italy is supposed to be so far behind other countries in the matter of summer Sanatoria is not that she is destitute of them, but that they are unknown or neglected. The more I see of the country parts of Italy, the more strange it seems to me that multitudes of foreigners, as well as of Italians, are obliged year after year to leave Italy, in search of summer quarters in Switzerland and elsewhere, when just as cool residences may be found, or might easily be developed, among the higher Apennines, and especially in the

mountains above Pistoia. Speaking generally, an altitude of from 3,000 to 4,000 feet will give a delightful summer climate in Italy, and there are numerous places at these heights along the whole range of the Apennines, where seekers for health and recreation will find not only a pure and invigorating air, but also as charming a variety of scenery as in any country in Europe. Few Italian cities are so fortunate as Florence in its summer retreats. Within a few hours' journey from the city are the charming solitudes of the great pine-forests of Vallombrosa; higher up among the rocky defiles of the mountains stands the old convent of Camaldoli (now open to visitors), weird and wild like in its solitary grandeur. Further away towards the north and nestling in the splendid pine-forests which skirt the highest carriage-way across the Apennines, are the now better known Abetone, Boscolungo, and Serrabassa; while lower down the valley stand Piano Sinatico, Cutigliano, San Marcello, and Gavinana, the former a shady little hamlet with its old-fashioned wayside inn, and the latter, three mountain village towns which are rapidly becoming popular as summer resorts. With the exception of Vallombrosa and Camaldoli all the places referred to are among, or near to, the mountains of Pistoia, and are not very far distant from each other. The same district is rich in mineral waters, some of which have a reputation not inferior to several of the more frequented spas in Germany and France. The principal waters are those of the Baths of Lucca, Montecatini, Grotto of Mon Summano, La Porretta, San Giuliano.

During the last two years I have devoted a large portion of my holiday time in visiting this district, and the whole of last summer was spent at Abetone, where I made careful observation of the climate, which I will lay before the readers of the *Practitioner*, when I speak of that truly magnificent retreat among the Northern Apennines. It may not be uninteresting to say in a few sentences what the qualities of the mineral spring are.

La Porretta, on the Pistoia and Bologna railway, is situated at the mouth of one of the gorges in the Apennines, and is nearly 1,200 feet above the level of the sea. The waters are *saline*, of a high temperature, and several of the springs contain hydrosulphuric acid. They enjoy a considerable reputation in cutaneous diseases. Season—June till September.

Montecatini, on the Pistoia and Pisa railway, is picturesquely situated in the valley of Nievole. These springs are also salt, and have long had a well-deserved reputation in diseases of the liver, spleen, and bowels, especially dysentery. Curiously enough, large numbers of Germans visit Montecatini, preferring it to Carlsbad. The chief sources are Tamarigi, Tetuccio, La Regina, and La Fortuna. Season—June till October. Usually very hot in July and August.

Mon Summano—The grotto of Mon Summano is one of the most important as well as interesting thermal grottoes of which we have any account. It is about half an hour distant from Montecatini, and is visited chiefly for the cure of chronic rheumatism. The patient enters the cave very slowly, and before he has proceeded far is bathed in profuse perspiration. Some of the worst cases of old rheumatism I have ever seen have been greatly benefited by several visits to this natural vapour-bath. It has also a good reputation in cases of Eustachian deafness.

San Giuliano, about five miles from Pisa, belongs to the class of "earthy waters," and has been long favourably known in cases of rheumatism, stiff joints, and kindred ailments. It still retains its reputation also for uterine disorders, being specially useful in long-standing and neglected subinvolutions.

The Baths of Lucca are the best known and most frequented of all the baths in Central Italy. They are situated in a beautiful valley about fifteen miles from the old town of Lucca, and until quite recently this was the only spot in Tuscany where foreigners ever thought of spending the summer. The baths themselves are unimportant, and are of the same *class* as those of San Giuliano. The "Bagni di Lucca" has been long better known as a favourite summer resort, and more prized for its *supposed coolness* than for its mineral waters. It has a great many advantages to recommend it. Here every comfort is to be found. The hotels and pensions are well kept, and the terms are very moderate, while the scenery in the neighbourhood is very beautiful; indeed there is everything fitted to make the place popular with visitors except *coolness*. The days are very hot, and not until the sun has well set can open-air life be enjoyed. The day is usually spent quietly indoors, or under the shade of some friendly tree, till the sun has lost his power,

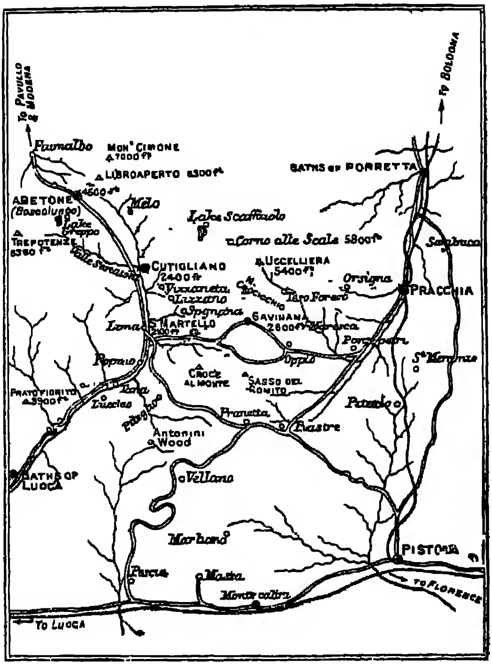
and then this beautiful spot becomes alive with hundreds of visitors, who, leaving their *darkened* rooms, like the moths sally forth to enjoy the evening air, and add their quota to the gaiety of the scene. Invalids, and elderly people who are incapable of exertion, may pass a very comfortable summer at the Bagni di Lucca; but the healthy and strong who are able for mountain work would find nothing here worthy of the name of *climbing*, and even if they did, the great heat of the sun during the day would prevent the majority of visitors from attempting to take advantage of it. The only other element in the climatology of the Bagni di Lucca to which reference may be made is the great dew-fall. The evening being the only time when visitors are able to enjoy exercise in the open air, the fact of a heavy dew-fall must be carefully kept in mind in advising invalids to pass their summer at this otherwise comfortable and pleasant place.

The places which have just been so briefly described have been more or less known to travellers in Italy for a considerable time; and as they were not, in my opinion, sufficiently cool as summer residences, at least for the greater number of English people who annually quit Italy in order to pass the summer in the mountains, I paid a visit three years ago, and again last year, to the valleys in the higher Apennines in search of cooler quarters, where the months of June, July, August, and September could be spent with comfort. In the course of my wanderings I came upon several interesting and beautiful spots at elevations of from 2,000 feet to 4,500 feet; but one in particular at the latter height which struck me as possessing every element fitted to render it, if judiciously developed, one of the most delightful and important mountain resorts south of the Alps. I visited Gavinana, San Marcello, Cutigliano, and Abetone, but before describing them separately I propose to glance briefly at the district generally, and the means of gaining access to it.

If the reader will look at a railway map, such as is found in any of the larger railway guide-books, he will find on the main line between Bologna and Turin the town of Modena, about an hour to the north of the former of these cities. Putting a pencil mark at Modena, let him now follow the line as far as Bologna and place another pencil mark there. Still tracing his way in the same manner, let him continue his journey

as far as Pracchia, and thence to Pistoia—marking these towns as before. The district thus mapped will be found, roughly speaking, to form the two sides of a triangle, and the triangle will be completed if the reader will now draw a pencil line across the map from Modena to Pistoia. The portions of Modena and Tuscany thus inclosed contain all the summer quarters named above. The accessibility to this district will be readily understood when the reader is reminded that frequent trains go from Modena to Pistoia *viâ* Bologna, and *vice versâ*, every day, and that there is a magnificent carriage road from Modena to Pistoia, crossing the Apennines at Abetone, which in some parts is exceedingly beautiful; the whole distance being about ninety miles. There are several ways by which Gavinana, San Marcello, Cutigliano, and Abetone may be reached. First, the traveller coming from the north may quit the train at Modena and take a carriage there, direct for Abetone. The distance is about sixty-two miles, and as a considerable portion of the road is an ascent he will be obliged to sleep at Pavullo, about twenty-five miles from Abetone. The drive from Pavullo to Abetone, by Barigazzo, Pieve à Pelago, and Fiumalbo, is both wild and beautiful. Another way, and a shorter, but quite as beautiful, is from Pracchia. The traveller proceeds by rail to Pracchia station, and here commences his carriage journey to Abetone. The drive takes about four and a half hours, and the road passes San Marcello and Cutigliano. Coming from Florence there are also two ways by which Abetone may be reached. The one is to go to Pracchia and take the journey just mentioned, or the traveller may leave the train at Pistoia and drive all the way to Abetone. The time occupied by this carriage journey is about eight hours, but it will well repay the lover of beautiful scenery who may choose to make it. Nothing, indeed, can be finer than the beauty of the views along the road. In four hours from Pistoia, San Marcello is reached, and here a halt is usually made to take refreshment and feed the horses. Making a fresh start, Abetone can easily be reached in another four hours. Carriages can always be had at Modena and Pistoia; but travellers quitting the train at Pracchia would do well to send to San Marcello for conveyances to come and meet them, as they are not always to be had at the station. The road from Pracchia goes along the right bank of the Reno for nearly three miles, and joins the

Pistoia-Modenese road, about seven miles from San Marcello. Less than an hour's drive after leaving Pracchia brings the traveller to the top of a rather steep ascent, from which he can see San Marcello, charmingly situated in the valley below. At Oppio, a rugged-looking hill-road turns off abruptly to the right, and after winding for two or three miles, first through roughly-cultivated ground, and afterwards through very fine chestnut woods, reaches Gavinana.



As names on the map may not be very distinct, I therefore reproduce a few here:—

PAVULLO.
PIEVE À PELAGO.
FIUMALBO.
CIMONE.
TRE POTENZE.
BOSCOLUNGO.
SERRABASSA.

SESTAIONE, Valley of.
LAKE SCAFFAIOLO.
ST. MEMMIE.
PRATO FIORITO.
LIBRO APERTO.
PITECCIO.
POPILIO.

PONTE PETRI.
CORNO ALLE SCALE.
MONTE CROICCHIO.
CROÇE AL MONTE.
SASSO DEL ROMITO.
SAMBUCA.

ON THE TREATMENT OF THE NIGHT-SWEATING OF PHTHISIS.

BY WILLIAM MURRELL, M.D., M.R.C.P.,

Assistant-Physician to the Royal Hospital for Diseases of the Chest, Lecturer on Practical Physiology at the Westminster Hospital

(*Continued from* Vol. xxiii. *p.* 430.)

XI. Amanita Muscaria.

Muscarine is so rarely used in the treatment of disease that I offer no apology for giving a short account, compiled from various sources, of the fungus from which it is obtained.

The agaricus muscarius, amanita muscaria, fly-agaric or fly-fungus—*agaric mouche*—is one of the largest and most beautiful of the agaricini, and well deserves the title of "imperial" applied to it by Batsch, "for the most indifferent person must be attracted by the glowing hues of its ample pileus, its regular form and tall pillar-like stipes, extremely conspicuous, even at a distance, in the shady recesses of its native woods." It is found most commonly in birch-wood, not very plentifully in England, although it is abundant in the Highlands of Scotland. Linnæus says that when infused in milk it kills flies, hence its specific name *Muscarius* and its popular name "Fly-agaric."

In Siberia and Kamtschatka the inhabitants use it as other nations do ardent spirits or wine, to produce intoxication. The fungi are collected in the hottest months and hung up by a string in the air to dry; some are dried on the ground and are said to be by far the most active. Those that are small, deep-coloured, and thickly-covered with warts, are said to be more powerful than those of larger size and paler colour. The usual

mode of taking the fungus is to roll it up like a bolus, and swallow it without chewing, which it is said would disorder the stomach. It is sometimes eaten fresh in soups and sauces, and then loses much of its intoxicating property. One large or two small fungi is a common dose to produce a pleasant intoxication for a whole day, particularly if water be drunk after it, which is thought to augment the narcotic principle. The desired effect is usually produced in one or two hours. Giddiness and intoxication result from the fungus in the same way as from wine or spirits. Cheerful emotions are first produced; involuntary words and actions follow. "The natural inclinations of the individual become stimulated. The dancer executes a *pas d'extravagance*, the musician indulges in a song, the chatterer divulges all his secrets, the orator delivers himself of a philippic, and the mimic indulges in caricature. Erroneous impressions of size and distance are common occurrences; a straw lying in the road becomes a formidable object, to overcome which a leap is taken sufficient to clear a barrel of ale or the prostrate form of a British oak." The most singular effect of this agaricus is its influence on the urine. It is said that from time immemorial it has been known that the fungus imparts an intoxicating quality to that secretion which continues for a considerable time after taking it. For instance, a man moderately intoxicated to-day will by the next morning have slept himself sober, but (as is the custom) by taking a teacupful of his urine he will be more powerfully intoxicated than he was the preceding day by the fungus. The intoxicating property of the fungus is capable of being propagated; for every one who partakes of it has his urine similarly affected. Confirmed drunkards in Siberia preserve this as a precious liquor in case a scarcity of fungi should occur This intoxicating property may be communicated to every person who partakes of the draught, and this with the third, fourth, and even fifth distillation. By this means, with a few fungi to commence with, a party may shut themselves in their room and indulge in a week's debauch. The passion of the Samoiedes, Ostiaks, Koraks, Kamtschadales, and other inhabitants of Eastern Asia for this species of intoxication is so great, that the poorer people drink the urine of those who have partaken of these fungi in order to induce its effects.

Numerous cases of poisoning with amanita muscaria are on record, the fungus being often mistaken for one of the edible varieties. The symptoms appear soon after the fungi have been eaten—usually in half an hour. Violent gastric and intestinal disturbance is as a rule present, but may be absent. It is not uncommon for cerebral symptoms to be the predominant feature, the patient becoming violently excited, as if intoxicated with alcohol; thus it is stated by Cosgerat that a young woman who had eaten some of these fungi ran about the house in her night-gown, beating her head against the wall, and screaming like one possessed. A very interesting case of poisoning by this fungus occurred at Calcutta, and was recorded by Dr. Chevers. An accomplished gentleman of temperate habits having partaken of some mushrooms at breakfast went into court and was surprised to find that he could not control his actions; everything appeared to him ludicrous; he laughed immoderately in open court, and ridiculed in an absurd way his superior officer. After some hours he recovered, but was greatly alarmed at his attack, of which he did not suspect the cause. His physician to reassure him returned with him to luncheon, at which, among other dishes, were stewed mushrooms. Of these the patient ate, and before the meal was over he became greatly excited; every person appeared ridiculous; the most ordinary remark seemed full of fun and wit, and his laughter was immoderate. Every object appeared to him perfectly beautiful. These exaggerated sensations continued for some hours, and were put an end to by the administration of ipecacuanha, which caused him to disgorge a considerable quantity of the fungus still undigested. When larger doses have been taken the sight has been affected, things being seen dimly as through a mist, and attacks of an epileptic nature have been observed. A state of stupor ensues, in which reflex action is abolished. The pulse is, as a rule, retarded, the arteries are contracted, respiration is short and stertorous, the pupils are dilated, the extremities are cold, and death ensues from progressive loss of cardiac power. Such are the accounts given of poisoning with fly-fungus.

Various attempts have been made to isolate the active principle of the amanita muscaria, and in 1866 Letellier extracted a substance which he called Amanitine. It was not, however,

till the year 1869, that Schmiedeberg and Koppe succeeded in obtaining an alkaloid—muscarine—possessing distinctly toxic properties capable of accounting for the powerful effects witnessed in cases of poisoning by the fly-fungus. The properties of this powerful substance have been so thoroughly investigated not only by its discoverers but by Prevost, Alizon, Lauder Brunton, Schiff, Ringer, and others, that there are few drugs with the physiological action of which we are more familiar. The proportion of alkaloid present in the fly-fungus has not been accurately determined, but the amount extracted is said seldom to exceed one-fifth per cent.

Dr. Ringer and Mr. Morshead have investigated the action on man of the muscarine prepared synthetically by Merck, of Darmstadt. They found that the smallest dose given hypodermically capable of producing symptoms was one-third of a grain. It contracted the pupil, excited profuse perspiration, free salivation, and running at the eyes and nose, and sometimes it purged and excited nausea and vomiting, with a strong desire to pass urine. According to Schmiedeberg and Koppe a thirteenth of a grain of pure muscarine produces in the human subject myosis, loss of focalizing power, abundant secretion of saliva, determination of blood to the head, flushed face, profuse perspiration over the whole body, giddiness, anxiety, griping and rumbling in the bowels, and weight in the head. It is a curious fact that whilst muscarine given internally contracts the pupil, its topical administration dilates it—in this respect resembling gelseminum.

In the lower animals muscarine produces symptoms very similar to those observed in man. Thus in cats we have increased salivary secretion, vomiting, diarrhœa, rumbling in the bowels, staggering gait, contraction of the pupils, frequency of respiration, and dyspnœa. Dr. Lauder Brunton has shown experimentally that the dyspnœa is due to contraction of the pulmonary vessels, and that it may be antagonised by atropia.

Perhaps the most striking action of muscarine is its influence on the heart. When a drop or two of solution of muscarine, or of extract of amanita, is brought in contact with the frog's heart, it almost immediately stops in diastole. If now a drop or two of solution of atropia be applied, the pulsations are restored and

the heart goes on beating again almost as well as ever. This reaction is the best and most delicate test for muscarine. It has been shown by Dr. Ringer and myself that duboisia, puturia, and pilocarpine, all antagonise the action of muscarine on the heart.

For the last six months I have used the agaricus muscarius in the treatment of the night-sweating of phthisis The preparation employed was a one-per-cent. solution of a liquid extract of about the consistence of treacle, which was kindly placed at my disposal by Dr. Ringer. The extract was, I understand, made in England from fungi obtained from Germany. I have treated in all twenty-six cases—sixteen men, and ten women, their ages ranging from forty-six to ten. They were all out-patients, and all were phthisical, many of them having cavities. In almost every instance the sweating was very profuse, none but well-marked cases being chosen. It was found that five minims of the one-per-cent solution of the extract was the smallest dose on which reliance could be placed, although in some instances smaller quantities succeeded. It was usually given in a little water, three times a day, but it answers well if given only at bedtime. A good plan is to give the three doses during the night, or at intervals of about an hour before going to bed. There is usually no improvement on the first night, but on the second or third nights the sweating is distinctly less, and by the end of the week has ceased, or is at all events so slight as not to put the patient to any inconvenience. In most cases the muscarius alone was given, but in a few instances the ordinary treatment was continued. It stops the sweating without the production of any abnormal dryness of the skin. The medicine is almost tasteless, and is taken without difficulty. One patient complained that it would not keep, and went bad before the end of the week,—the addition of a few drops of spirit overcame that difficulty. There is no danger in taking the medicine, for a delicate young woman of twenty-three took fifteen minims every three hours for a week, and then twenty minims every three hours for another week, without the production of any symptoms. By reference to the accompanying table, it will be seen that in almost every case—with the exception of those in which the dose was known to be too small—

marked benefit was received. Muscarine appears to act in much the same way as picrotoxine and pilocarpine. The latter have at present the advantage, as they are more readily obtained. In using agaricus muscarius care should be taken to see that it is the real drug that is procured. Its power of arresting the action of the frog's heart when topically applied is the test of its activity

POSTSCRIPT TO ARTICLE ON PICROTOXINE (OCTOBER, 1879).

Mr. Martindale informs me that the 1 in 240 aqueous solution of picrotoxine is in winter an unreliable preparation, for when the temperature falls below 40° F. much of it crystallises out. He suggests (*British Medical Journal*, February 28th, 1880) the addition of a little glacial acetic acid to keep it in solution, and gives the following formula:—

Picrotoxine, 8 gr.
Glacial acetic acid, fl ʒ iv.
Distilled water to fl. ℥ iv.

Mix and filter.

This is a 1 in 240 solution, so that four minims would equal $\frac{1}{60}$ gr. I tried it in four cases of night-sweating, and it succeeded quite as well as the simple aqueous solution.

Pills containing $\frac{1}{60}$ gr. of picrotoxine are made by rubbing it up with sugar of milk and adding a glycerine or tragacanth. They answer admirably.

POSTSCRIPT TO ARTICLE ON JABORANDI (DECEMBER, 1879).

The strength of the tincture of Jaborandi employed was 1 in 2.

Cases of Night-Sweating of Phthisis treated with Muscarine.

No	Name.	Sex	Age	Symptoms	Physical signs	Night-Sweating—Duration and Severity of	Treatment.	Results	Remarks
1	J. M	M	25	C for 2 to 3 years Ex. thick, yellow, copious Hæ about a pint a year ago, and smaller quantities since. L F. very much. No fam. hist of $\phi\theta$	Rt cav Lt cav Lung mischief progressing rapidly, great weakness, anorexia, &c Prog very bad	Has been under observation 7 months, and the N S have been constant if not checked by treatment, most profuse Present attack of sweating has lasted over 3 weeks.	Sol Muscarine 1 % ♏ii Aq ℥i t. d s 4 days	First night no better, second night much less, last two nights none at all—quite dry. Has answered as well as anything he has had	In former attacks, (1) Picrotoxine, and (2) Pilocarpine answered admirably In present attack, (1) Oxide of Zinc—12 grains a day; and (2) Pilocarpine gr. $\frac{1}{30}$ t d had failed
2	A. T.	M.	43	C 1½ years, with thick yellow ex. Hæ. in small quantities, frequently. L F much.	Dulness and crep in both infra clav regions.	For last 5 months constantly, when not checked by treatment This time 4 nights, very bad, "a nasty sour sweat" Wet his flannels, chiefly in early morning	Sol Muscarine 1 % ♏i t. d. last dose h. s 7 days	No better at all; most profuse. Came on this morning about 6 0, and "might have wrung his things," so wet	In a former attack, some months before the N S. was arrested by Pilocarpine
	contd.	...	...	... ...	... ...	... ...	Rep ♏iii 4 days.	Some improvement, but not much, still has sweating every night	The Muscarine failed at first because the dose given was too small
	contd	...	...	... ...	... ...	... ...	Rep. ♏vi. 4 days	Sweating has completely ceased. Was then given Aq Camph., and no return during the fortnight he remained under observation	
3	J P.	M.	46	Caught cold from getting wet at a fire 6 months ago, and c ever since, with thick ex. Hæ. half a cupful 18 months ago. L F. ½ st. in a few weeks	Lt. flat infra clav, with def movement, coarse crep. all over; breaking down	For about a week, comes on between 5 and 6 a m, wet all over, a cold and chilly sweat.	Sol Muscarine 1 % ♏ii t. d. s 4 days	Has had it every night, but not so much Some improvement	Here again too small a dose was given at first
	contd.	...	...	... ...	... ...	... ...	Rep. ♏iii 4 days	Decidedly better, but not gone yet	
	contd.	...	...	... ...	... ...	... ...	Rep ♏iv. 4 days.	Quite gone, has had none for last two nights. Remained under observation for 3 weeks longer. There was no return	

Cases of Night-Sweating (continued).

No.	Name	Sex.	Age.	Symptoms.	Physical signs.	Night-Sweating—Duration and Severity of.	Treatment	Results	Remarks
4	E. C.	M.	15	C. 8 or 4 months; getting worse. Ex. none; hæ none L F 6 months v. much. F. and M. suffer from chest 1 S d $\phi\theta$. 2 Brs and 1 S now out patients.	Lt. def movement high pitched, harsh breathing, no crep	2 or 3 weeks every night, comes on soon after he goes to bed, and lasts all night Is always "all of a muck-sweat" at night Cold in the day	Sol Muscarine 1 % ♏︎$\frac{5}{8}$ o n 7 days.	Not much improvement till the 5th night, when it was less, and last night it was less still	Here it was given only at bedtime, and it succeeded in a smaller dose than usual, even taking the patient's age into consideration
	contd.	...	...	... ...	... ...	... ...	Rep ♏︎i. o. n 7 days	Great deal better, not enough to trouble him at all now 6 weeks later mother reported that there had been no return of the N S	
5	W. J	M.	25	Never ill till he had typhoid fever last summer, and never well since C with expect. Has not regained his original weight since the fever	Rt fine crep in infra clav. Lt br br	Came on after the fever, not every night, but never goes a week without it, has it 3 or 4 nights running, and then misses 3 or 4 Comes out in great drops as big as peas—just as if some one had thrown water over him	Sol Muscarine 1 % ♏︎xv Aq Oss ℥ss t. d s. last dose h. s	No improvement N S very bad almost every night	This was one of the preliminary experiments, and the dose was far too small to do any good. The dose was not increased, because I was anxious to try some new Picrotoxine pills, containing $\frac{1}{60}$th of a grain in each and these stopped the sweating at once, and spoilt him for further observations
	contd	...	...	... ...	... ...	... ...	Sol Muscarine 1 % ♏︎xx Aq op ℥ss t d s last dose h. s.	No better in any way.	
6	T H	M.	24	C. 6 weeks, ex L F about 6 weeks very much Has had to give up work, and has been at home last 3 weeks	Lt. def. movement, and ? higher pitched in infra clav.	Last 3 weeks, every night, comes on about 12, lasts 3 or 4 hours, goes off, and then comes on again, just as if he had been in a pond, wet all over	Sol Muscarine 1 % ♏︎v Aq ℥ss. t. d s. 7 days	1st day took only 2 doses but sweating not nearly so bad at night 2nd day 3 doses, and sweating at night very much less Has continued taking it and now at end of week is only a little dampness on forehead and legs at night, nothing to trouble him; not so weak in the morning; better in every way.	Medicine discontinued, and sweating returned in a fortnight

Cases of Night-Sweating (continued).

No.	Name.	Sex	Age.	Symptoms	Physical signs.	Night-Sweating—Duration and Severity of	Treatment	Results.	Remarks
	contd	..	..	... ...	... .	For last 3 or 4 nights has been almost as bad as ever.	Rep 7 days	N S nearly gone at end of week, a week later medicine being discontinued, quite gone	
7	H W H	M	14	A bright intelligent boy; a printer's reader Was quite well till a fortnight ago, when he brought up a lot of blood after reading Now C Ex L F m d. ch. br. and asthma.	Rt little rhonchus at base posteriorly. Lt def movement.	Ever since he spat up that blood—almost every night Awakes in morning, and finds things wet through—very weak from it	Sol Muscarine 1 % ♏v Aq ℥ss. t d s 7 days.	Quite gone A little on the 1st night, and none since Discontinued, and no return a month later.	
8	L. E.	F.	23	C. 3 months, with ex a great deal, difficult to get up L F very much, close on 1 st in 3 months	Lt. fine crep. at base	N S 1 week, every night, sometimes worse than others, on a bad night enough to wet things through, comes on about 3.0 a.m.: sweats in daytime, too, on slightest exertion, now covered with perspiration	Sol Muscarine 1 % ♏v Aq ℥ss 7 days t d. s	Better 2nd night, none at all last 3 or 4 nights, very much better	
9	J B	M.	29	C with ex., and great L F. In former years drank very much, and even now indulges not infrequently	Rt crep apex to base Lt same Prognosis very bad	N. S. 4 or 5 nights every week, from feet to neck, in morning is lying in a regular pool	Sol Muscarine 1 % ♏v Aq ℥ss 7 days t. d s.	Quite ceased; got better and better every night till now there is none at all Discontinued, and no return in a fortnight.	Sent to Australia to give him a last chance, so ultimate result not known.
10	R. L.	M.	19	C. 7 or 8 months, with thick yellow expect L. F Hæ 6 or 7 weeks ago, a cupful, and still a little at times.	Lt dull at apex with fine crep	Last 9 or 10 nights very profuse, has to throw all the things off him.	Sol Muscarine 1 % ♏v Aq ℥ss t. d s. 7 days	Quite gone now; began to feel better on the third night	At time sweating came on first had been taking Chaulmugra oil ♏iii-v quater die for 3 weeks.

Cases of Night-Sweating (continued).

No.	Name.	Sex.	Age.	Symptoms.	Physical signs.	Night-Sweating—Duration and Severity of.	Treatment	Results	Remarks
11	M. S.	F.	24	C 6 weeks very bad, with great deal of expect Hæ none L. F. not much.	Rt def. movement, and high pitched in infra clav Lt nil.	N S 5 or 6 weeks, since c came on, wets flannels quite through, even in day time very much on exertion.	Sol. Muscarine 1 % ♏v Aq. ℥ss t d s. 7 days.	Better the 2nd night, and none since Discontinued under observation for 6 weeks longer, and no return	
12	J. A.	M.	22	C. all his life, in hospital with it several times Ex. very much at times L.F. lately, but varies much. M has φθ	Lt def movement, but no crep.	N. S about 1 month, every night, as soon as goes to bed, lasts all night, keeps on waking him up.	Sol Muscarine 1 % ♏v Aq ℥ss t d. last dose h. s. 7 days.	Better the 1st night, and now very nearly gone	
13	A. P.	F.	17	C. 5 months, with ex and a little hæ.	... ...	N S. at intervals for 8 months; last 3 weeks very bad, almost every night.	Sol Muscarine 1 % ♏v. Aq ℥ss 7 days t d. s	Cured the sweating in 3 days. Remained under observation for 10 days longer, but there was no return.	
14	T. R.	M.	23	C 8 months, with thick yellow ex. Dysp on exertion. L. F very much. Still able to do his work as a policeman, though with difficulty.	R. cav. Lt breaking down.	Repeated attacks for the last 8 months, in fact every night, when not checked by treatment This time about a week—all over the body.	Sol Muscarine 1 % ♏v. Aq ℥ss Quater die 7 days	Better on 3rd night, and none at all since.	In former attacks Picrotoxine and Pilocarpine had been given with success.
15	J. W. E	M.	27	C. 6 months or more, with ex L F. very much	R. crep. all over. Lt cav. with much secretion.	For last 6 months has had repeated attacks—hardly ever free from it This time for 6 nights only, but as bad as ever he knew it—from toes to top of head has not a dry spot on him at night, rarely more than ½ hour's sleep. In daytime, too, if stops in bed	Sol Muscarine 1 % ♏v. Aq ℥ss Quater die 4 days	At first took it at equal intervals throughout the day, but that only checked it—did not stop it. Then took it only in the evening—a dose at 6, 8, 10, and 12, and that stopped it Better night last night than he has had for a very long time No return for 15 days.	In former attacks Jaborandi and Pilocarpine had checked the sweating admirably.
	contd.	...	...	... ...	... ...	Has had it now for a week as bad as ever; runs off him at night	Rep. 7 days.	Completely stopped before end of the week.	

Cases of Night-Sweating (continued).

No.	Name.	Sex.	Age.	Symptoms	Physical signs	Night-Sweating—Duration and Severity of	Treatment.	Results	Remarks
16	G H.	M	38	C. 12 months, w ex. Dysp very great.	$\phi\theta$	N. S. off and on 2 or 3 nights a week, enough to wet his things, comes on towards 8 or 9 in the evening. Even in day sweats very much, and hands always clammy and wet.	Sol Muscarine 1 % ℥v. Aq ℨss t d. s 7 days.	At first took it at 8 a m, 3 p m, and 7 p m, but without much benefit, although it checked it, then took it at 7, 5 and 9 p m, and in 2 days it had quite ceased	
17	A T	F.	10	C 8 months very bad, but a little since a baby. L. F. very much	R cav. Lt cav	At intervals last 8 months. For last month has had it every night, wets things very much.	Sol Muscarine 1 % ℥v Aq ℨss 14 days o n.	Quite gone—was none after end of 1st week	Was also given a teaspoonful of cod-liver oil 3 times a day In former attacks Picrotoxine had done well.
18	J. J.	M.	39	C very bad, especially at night 2 months with expect	Rt. absolute dulness in rt. in infra clav. with coarse crep all over that side.	2 months, not regularly every night, but if not every night, every alternate night. Goes to bed at 11, and it comes on at 2 or 3 a.m.; wets him through, and makes him feel very weak	Sol Muscarine 1 % ℥v. Aq ℨss. t d s. 7 days.	Took medicine at 9 and 11 p m., and at 1 a m, and in 3 nights better Under observation 3 weeks longer, and no return	
19	B D.	F.	22	C. on and off for 2 years, but much more since confinement, 6 weeks ago, when lost very much blood Great deal of ex since then. Dysp very great on exertion	R. cav. Lt cav. Skin very hot	Only since confinement—every night; enough to wet nightgown, has to dry it before she can put it on	Sol Muscarine 1 % ℥v. Aq ℨss t d s 7 days	Took it at 7, 9, and 11 p m, had sweating only 3 times during week, but those nights thinks it was worse than ever.	
20	A. D.	F.	46	C. 2 years, with ex great deal No hæ. L F very much, can hardly walk, so weak. Diarrhœa, bowels open freely after each meal.	? No crep Nothing definite detected.	Off and on for the last 3 years, lately night and day; will run down legs into stockings, just as if she had wetted them, goes on drip, drip, drip, all day and night If not in a hot sweat is in a cold one.	Sol. Muscarine 1 % ℥v. Aq ℨss t. d s 7 days	Taken at 6 a m, noon, and 6 p.m. No better	Also given Ol Morrhuæ ʒii t. d s
	contd.	...	...	... ...	... ...	... ...	Rep. ℥x.	Taken at 6, 12, and 6, Not nearly so bad, does not drop off her as it did Not gone; least movement still brings it on.	Ol. M. discontinued, and Infus. Quass given instead.

Cases of Night-Sweating (continued).

No.	Name	Sex.	Age	Symptoms.	Physical signs.	Night-Sweating—Duration and Severity of	Treatment.	Results	Remarks
	contd	...	...	... ...	... ...	.. ..	Rep 4ts horis	Improvement still more marked.	
	contd.	...	...	... ...	... .	... .	Rep ♏xv. 4ts. horis.	Hardly any at all now.	
21	S. R.	F.	20	C. 6 month, with expect Dysp. L. F. 4 years	Lt def. movement, dull cav resp, coarse crep	All winter every night, comes on about 11 or 12 o'clock, all over body, and wets things	Sol Muscarine 1 % ♏v Aq ad ℥ss o n. 14 days	Sweating quite gone. Went by degrees None now for some nights	Was also given a gentian and soda mixture, with cod-liver oil and cough lozenges.
	contd	...	...	... ...	... .	Returned in a fortnight as bad as ever	Rep. ♏x. t. d s	Quite gone. Checked it almost at once	
22	E S.	F.	30	C, expect., hæ L. F.	R. cav not much secretion Lt cav.	Last 6 months very bad—sheets wet every night Just same as when she had "acute phthisis" at Guy's	Sol Muscarine 1 % ♏v. Aq ℥ss o n 14 days.	Has done a great deal of good to the N S; none at all last 3 nights—"nice and cool and comfortable" Feels better in the morning, better altogether, can eat better	Has been attending at hospital since May, 1878 3 years before that had "acute phthisis," for which she was an in-patient at Guy's for 6 months Has done remarkably well on arsenic and pancreatic emulsion
23	R. J.	M.	24	C 2 years all year round Expect 1 year only. Dysp very great. L F. 2 months, but not very much	R. cav. Lt cav Skin very hot.	7 weeks, almost every night.	Sol Muscarine 1 % ♏v. Aq ℥ss t d. s 7 days.	Taken at 5, 7, and 11 p m Nearly gone in a week, then taken for another week, and quite ceased A month later reported that there had been no return.	Also took cod-liver oil at same time
24	E. B.	F.	23	C 8 months, with expect a great deal. Hæ streaks at times, never more. L. F not lately. No fam. hist of $\phi\theta$.	Rt. crep. in infra clav. Lt deficient movement, higher pitched, coarse crep; breaking down	About a month, getting worse every night; whole of the last week has had to take the sheets off the bed, and dry them, not in daytime	Sol Muscarine 1 % ♏v Aq ℥ss. t d. s. 7 days	Taken at 5, 7, and 9 p m Little better the 1st night, still better the 2nd night very much better the next 2 nights, last 3 nights as bad as ever. C. much worse	

Cases of Night-Sweating (continued).

No.	Name.	Sex.	Age.	Symptoms	Physical signs	Night-Sweating—Duration and Severity of.	Treatment	Results.	Remarks
	contd.	...	...	.. ..	... ...	... ...	Rep ♏viii 4 days	Taken at 8, 10, and 12 p m. Little better last night, but not much	C., ex , and other symptoms much worse
	contd.	...	...	... ...	... ...	... ...	Rep 3ts horis 4 days.	Some improvement, but not very much. On whole better, but things still damp at night. Now perspires after coughing in daytime	
	contd	...	...	... ...	... ...	... ...	Rep ♏x 3ts horis 7 days	Better decidedly this week Has done most good to the night-sweats.	
	contd.	...	...	... ...	... ...	... ...	Rep. 7 days.	Both night-sweats and day-sweats much better now, though not gone	Patient complained that although the medicine was quit tasteless at the beginning of the weel it went bad in 4 or 5 days, and the smell was so bad she could not take it The spirit was put in to keep it.
	contd.	...	...	Has lost 10 lbs in weight in 4 weeks	... ...	... ...	Sol. Muscarine 1 % ♏xv S. V Rect ♏v Aq ℥ss 3ts horis 7 days	Does not think the sweating has improved much this week.	
	contd.	...	...	... .	... ...	... ...	Rep. ♏xx 3ts horis 7 days	No improvement Great weakness Losing flesh fast Prognosis very bad, given cod-liver oil, &c	
25	L. S.	F.	22	C all her life, but much worse last month or two. Expect. great deal, thick, green, has streaks. L. F. 1 st. in about 9 months.	Rt coarse crep all over.	2 or 3 weeks, not very bad; things wet in the morning, all over the body; every night the same	Sol. Muscarine 1 % ♏i. Aq ℥ss. o. n 7 days	Began to get bad in two or three nights, and now does not sweat at all—quite dry at night The medicine was discontinued, and she was kept under observation for a month longer, but there was no return of the sweating.	In this case the mus carine acted in an usually small dose This may be ac counted for by the fact of the sweating not being very bad at first
26	T. T.	M.	30	C., expect., dysp. Formerly L.F., now gaining.	Lt def movement, br br. infra clav. with little coarse crep. No dulness either side.	Last fortnight, not every night; has them perhaps 2 nights running, and then none for 2 nights Last night and night before very severe, enough to make things quite wet	Sol Muscarine 1 % ♏v. Aq ℥ss. t. d. s. 4 days	Only a little last night and none the other nights Under observation 3 months longer, but no return	A very old patient At onset of sweat ing was taking coc liver oil, and rub bing chaulmugra into chest at bed time This wa continued.

THE EARLY AVOIDANCE OF WRITER'S CRAMP.

BY AUGUSTUS WALLER, M.B.

UNDER the generic term, *writer's cramp,* are comprehended various perturbations of manœuvres that require the delicate and harmonious action of several muscles. It appears that co-ordinations which have been organised by the repetition of grouped movements, become disorganised by their excessive exercise—witness the ataxies of writing, piano-playing, violin-playing, drawing, milking, hammering, sewing, and the like. Dr. Hughlings-Jackson, considering that the excessive function of a centre entails its congestion, and this its atrophy, regards the effect in the light of a stricture on the paths of function in centres, with consequent overflow into channels inappropriate to the required manœuvre. If we regard a normal manœuvre as perfected by the diminished central resistance canalised in given directions, its disorderly attempt may be taken as the expression of impaired resistance in these directions. We may look upon the superabundant discharge as expressing the tetany of spinal centres which are irritable and permit excessive irradiation, whose local condition is therefore analogous with the general condition brought about by strychnia. The bearing of a satisfactory verdict between two such opposed theories is evident. By the one, we picture a functional densification, a stricture on the right path, consequent overflow into wrong paths. By the other, a functional rarefication, a leakage from the right path into wrong paths also. Through the former theory we should see a condensation to be cleared by exercise; through the latter, a rarefaction to be restored during rest. But in point of fact it appears that both theories share in the representation of

procedure; that normal function, irritability and exhaustion, are the symptomatic sequence—expressible as normal outflow, incontinence and stricture of nervous force—depending on a resistance normal, impaired, increased, of a tissue normal, congested, in sclerotic atrophy.

In business-cramps as a rule are to be distinguished two modes of procedure, (1) *spastic*, (2) *paretic*. Of the spastic form, the earliest indications are slight spasmodic movements of particular fingers, causing an occasional irregularity. Of the developed affection spasm is the continued characteristic, clonic, also tonic, seizing upon the overworked muscles, upon their antagonists, upon their associates, least then most remote, until at last the whole arm shares in the commotion. If writing be the required manœuvre, it is slow, as if resisted, and the patient gradually adopts every possible muscle by which the pen may be somehow guided to trace the characters required. Of the paretic form the characteristics are, weakness and fatigue. Brief exercise gives rise to excessive fatigue, soon followed by pain and stiffness, and the patient can no longer pick out the movement of his craft. It is a feature of the disease, when not excessive, that it obstructs one particular manœuvre, at a time, when other manœuvres requiring the same muscles in different combinations can still be performed. Still the more advanced the disease, the more generalised is the incapacity.

The indication for treatment is rest, and its most hopeful prospect lies in its earliest observance. At the outset we have an altered dynamic condition of centres concerned in an habitual activity,—a resistance impaired at certain points. Let these centres recuperate where they are weak; at the first sign vary the monotony of their action, cause other muscles to perform, while the originally affected muscles are still the most ready to perform and the most liable to fail. Do not wait until they have failed, until diminished resistance and irritability have passed into the maximum resistance of absence of tension and exhaustion. If a patient accustomed to wear tight sleeves has worked too much with the short muscles of his hand, cause him to wear loose sleeves and a tight fitting glove. If a patient is accustomed to write from his wrist, cause that joint to be immobilised. If he writes with his arm high, order him to

write with his arm low. In short, from the very outset, force him to adopt a habit diametrically opposed to that which he has hitherto practised. If, at this time, before irritability has entered into exhaustion, a co-ordinated mechanism as new and different as possible be enforced, physiological rest will be sufficiently obtained, and the balance between the power available and function required will be restored,—provided always that restraint of failing power be secured, and not mere aggravation of labour. But it is difficult at this stage to convince the sufferer of its importance; it is not usual to be asked to help him so soon. He comes with a story of symptoms that have progressed. Yet I shall hardly be contradicted in the supposition that many patients, under the spur of necessity, continue the more and more vitiating exercise for some period after they have first consulted the physician. It is to such that the foregoing principles are most applicable in practice, and doubtless some few might be enabled to escape heavier and otherwise unavoidable evils.

Therefore, if a man must or will write, devise some mechanical restraint in order that he shall write as differently as possible, and do not delay until he shall be *quite* unable to write as he has been accustomed.

When weakness of the overworked group has passed into its impotence, not only will its ability never be restored, but other groups, containing members of the used-up group, will not be available for the manœuvre; the mechanism of other manœuvres will be impaired, and a debility from a patent preventible cause will have initiated an irresistibly progressive condition.

ON THE TREATMENT OF JAUNDICE.

BY HENRY COOK, M.D., M.R.C.P.,

First Physician J. J. Hospital, Bombay.

THE successful treatment of jaundice is by no means recognised fact in medicine.

The young practitioner who meets with his first case of obstinate icterus appeals in vain to his text-books on medicine for assistance in his dilemma; and his clinical experience in hospital wards will give him no very reliable data. He is directed to discriminate between the two more or less distinct classes to which his case may be relegated; and if it be one due to obstruction he is recommended to remove it, if possible, to promote the secretion of bile, and the renal and cutaneous excretions, and to attend to the symptoms which the absence of bile from the intestines may have set up, &c. While, if he is able to decide that the case is not due to such a cause, he is left under the circumstances to do the best he can.

The first task will often puzzle him, for there are cases which cannot easily be placed either exclusively in the Hepatogenous or Hæmatogenous group, and as Niemeyer so forcibly insists, every case of the former may (must he says) lead to one of the latter, from absorption of the biliary acids and the consequent disintegration of the blood corpuscles, and the formation of biliary colouring matter.

As regards remedies, his choice is chiefly between the various purgatives and cholagogues; but I think I may safely say that no very satisfactory results follow the use of either, or at any rate none so satisfactory that his experience in his first case lends him much confidence in the treatment of those that may follow.

The object of this paper is to suggest a remedy that meets many of the indications for treatment and is applicable to many, perhaps the majority, of non-fatal cases of the disease. That many cases are entirely beyond the reach of remedies is too well known for me to insist upon. The causes of icterus are multiple; but may be separated into two classes, the mechanical and non-mechanical. The former includes all those which depend on obstruction to the flow of bile from the liver, or gall-bladder; the "hepatogenous" group, in which there is reabsorption of both colouring matter and bile acids into the blood. The latter comprehends those causes which give rise to bile pigment in the blood from disordered or suspended function of the liver, or possibly more recondite causes, which, according to the views of Virchow, Kuhne, Hoppe-Seyler and others, bring about the charging of the blood with bile pigment from the dissolution of its corpuscles:—the "Hæmatogenous" class. It is not my intention here to enter on the discussion of this abstruse subject, it will suffice very briefly to enumerate the disordered conditions which belong to the causation of each class.

The recognised causes of the first group include, impaction of some substance more or less hard, and closure of the ducts: catarrh of the ducts or of their common orifice: organic changes in the walls of the same: external pressure by tumours of very various kinds: and the entry of round worms from the intestinal canal;[1] while those of the second group may comprise disorders of the viscus which suspend or destroy its function; from merely disturbed innervation (as violent mental emotion) to organic destruction of its tissues; or diseases of the system which induce grave changes in the character of the blood, as fevers, snake poison, certain mineral poisons, or others, such as phosphorus or chloroform; and some less evident causes, amongst which may be included septic and malarial poisons.

The first class takes the pre-eminence in frequency in India, as elsewhere, whereas the second does so in gravity.

While obstruction, due to mechanical closure of the duct from calculi or inspissated bile, as members of the first group, are not

[1] I met with a fatal case of jaundice a few years ago in which the ducts of the liver were completely blocked with round worms, while bundles of these were found in the substance of the liver, and their movements were perceptible (on exposing the organ) through its peritoneal coat.

uncommon, the most frequent cause in my experience is undoubtedly catarrh of the ducts, giving rise to closure more or less complete. In cases of the second class icterus, in India, is in the majority of examples the result of malarial fevers, or more rarely of recurrent fever.

In many, perhaps the majority of cases, the relegation to one of the two classes of causes is easy, but as I have before hinted it not very infrequently happens that difficulty arises. Certain cases, which are doubtless at first due to obstruction from catarrh of the ducts, may assume an aspect in which the distinctive features are lost; I believe that in these the lesion exists in the minuter divisions of the hepatic duct throughout the substance of the organ, and as a consequence bile pigment and the bile acids are absorbed into the blood, and that result which I have alluded to, as insisted upon by Niemeyer, takes place, giving rise to pathological conditions distinctive of the hæmatogenous group.

In such cases there is no fulness or prominence of the gall-bladder, because little or no bile reaches it; but there is generally fulness and tumefaction of the liver itself, with distinct symptoms of weight, oppression, and perhaps tenderness on pressure over its region, while, if the condition is not relieved, graver symptoms may set in, such as those which mark the members of the second group.

Similar cases, in my experience, are frequently met with, and are due to chill, the patient usually dating the commencement of his disorder from some act of indiscretion, as sitting in damp clothes after free perspiration, or lying uncovered at night in a current of air, which so frequently in Bombay suddenly changes its temperature towards morning.

In these instances the premonitary symptoms are usually these. The patient feels out of health, loses appetite, the bowels became constipated, and more obstinately so as the case goes on, the tongue furred and sticky or dry in the morning. He is more or less slightly feverish, disinclined and indeed unfit for exertion, mental or bodily, his work is felt to be unusually irksome and heavy, and headache is frequent. He has recourse to purgatives with little effect, and now notices that his motions are pale or colourless; while his urine is thick and

dark. Then earlier or later he detects a yellow colour in his skin, or what is more likely, his friends do so for him. These symptoms come on thus gradually (a very different history from that which holds in sudden obstruction of the common duct), and gradually intensify as more and more of the minute ducts become involved in the catarrhal conditions.

It is in such cases, thus frequently met with, that the treatment by large doses of ipecacuanha is most successful; and in clinical illustration of the subject I will give notes of three cases which have lately come under my notice.

The first (in March last) was a young and athletic man (an Englishman) who had enjoyed remarkably good health during his residence in Bombay, a period of some four or five years. A fortnight before I saw him he had remained an unusually long time in the swimming-bath, and had felt some chill on coming out. Symptoms of malaise such as I have given above followed; he had noticed the absence of colour from the motions for some days, and the urine was as thick, he said, as bad beer; when a friend had stopped him and declared that he was jaundiced. This had occurred a few days before, and meanwhile he had tried to treat himself with saline purgatives, but, feeling worse, had sought advice. He was thoroughly jaundiced, the colour was particularly well marked over the chest and abdomen and in the conjunctivæ. The urine was charged with bile colouring matter, giving a brilliant green with a drop or two of solution of iodine, but no bile acids could be detected; the motions were white, there was no fulness of the gall-bladder and no great enlargement of the liver; pulse fifty-six, slow and full, tongue loaded, the fur being yellowish, much headache, and pain across the loins and back.

For some days he was treated with salines and podophyllin, with small doses of ipecacuanha frequently in the day, but symptoms deepened, and he felt worse, the tongue becoming dry. On the 24th I ordered forty-five grains of ipecacuanha with the usual preliminary sedatine draught and sinapism to the epigastrium. He kept down the whole of the dose. 25th, tongue less dry, head clearer. 26th, repeated the dose of thirty grains. 27th, decidedly better, no headache, pain across the back gone, tongue moist though furred, less disgust for food; bowels acted

spontaneously, motions fluid and slightly coloured with bile, urine clearer. 28th, repeated the dose, giving twenty grains. 29th, states that he feels much better, and looks so, appetite returning and the urine clearing rapidly. 30th, urine quite free from any bile pigment (with iodine test), stools coloured, tongue clean and natural. The icteric tinge disappearing. He was now ordered chloride of ammonium with dilute nitro-hydrochloric acid, and in a few days reported himself quite well.

The action of the remedy it seemed to me was direct and unmistakable.

The second case was somewhat longer in reaching the icteric stage. It occurred in a young lady aged 18, who had resided about a year in Bombay. For some little time her appetite had been failing, she had felt listless, weary on slightest exertion, with general *malaise* The bowels were constipated and urine high coloured. On taking a somewhat longer walk than usual she returned quite knocked up. I saw her on the 15th of August; she complained of headache and nausea and of feeling generally unwell, and thought that she had taken chill from sleeping in the wind, her bed being placed before an open doorway. The tongue was coated, pulse eighty, skin cool. There was an uncomfortable feeling in the region of the liver, and on examination it was found to be enlarged three fingers' breadth below and two above its normal limits.

She was ordered nitro-muriatic acid with chloride of ammonium, and a dose of mineral aperient water in the early morning, while small doses of podophyllin and ipecacuanha were to be taken twice a day with meals. No improvement followed this treatment, and on the 20th symptoms of jaundice were observed, the conjunctivæ and the skin, especially of the face, neck, and chest, were yellow The urine was dark coloured, and gave very decided indications of biliary matter with tests. The motion was found to be quite white and clayey. She complained of nausea and vomiting after food, and was much depressed. A dose of twenty grains of ipecacuanha was given, which was retained for two hours; after which she vomited two or three times 21st, no great change was observable. 22nd, the dose was repeated, fifteen grains being administered. 23rd, there was some indication of improvement. The motion was

coloured, while the urine was decidedly lighter in colour. The dilute nitro-hydrochloric acid with chloride of ammonium was resumed. 24th, the improvement more marked, urine getting clear, motion more coloured, felt better, and had a slight desire for food. 26th, the urine had become quite clear, the motion was now *dark coloured*, and of natural consistence. Appetite had returned, the icteric appearance was rapidly declining, the liver had returned to its normal limits. 28th, felt quite well with the exception of some weakness.

In this instance two doses of ipecacuanha sufficed to restore the normal action of the liver and to remove completely the jaundice.

The third case was that of a Parsi of middle age, who had been ill for some weeks and had been subjected to varied treatment, which included one large dose of ipecacuanha. I saw him on the 27th August in consultation. He was suffering from great depression, and took a very gloomy view of his case. The skin was deeply coloured, dusky, and dingy looking. Urine very dark, while the motions were white. He was unable to take food, and suffered greatly from nausea and dyspepsia. There was some fulness of the liver, but no distension of the gall-bladder. The patient was so weak and reduced, and was stated to have suffered so much depression from the dose of ipecacuanha before administered, that I hesitated in prescribing this remedy. On carefully, however, considering the reasons for and against the measure, I decided on ordering a dose of twenty-five grains, to be given with the usual precautions, and directed that should he suffer from urgent depression stimulants were to be freely administered. He bore the dose better than was anticipated; and it was repeated on the 29th. On the 31st bile re-appeared in the motions, and the urine began to clear. A third and smaller dose was given, which sufficed to restore the biliary function of the liver, and recovery rapidly followed.

These cases may, I think, be all referred to the Hepatogenous group, though the last was rapidly assuming some of the graver symptoms of the second class. In neither were there any decided indications of obstruction of the common duct, and I believe all were due to catarrhal conditions of the hepatic ducts and their minute branches. The lateral pressure in these and in the hepatic cells doubtless had steadily increased until the

bile elements had found their way into the circulation through the commencing venules of the hepatic vein, and the initiatory branches of the lymphatic system of the liver.

The beneficial action of the ipecacuanha is, I believe, exerted on the mucous membrane of the ducts, in common with the mucous membrane of the intestinal tract generally, acting first on the larger branches, and in relieving their congested and tumefied condition, permitting the gradual reinstalment of the bile current, which, slowly reaching the intestines, gradually tinges the fæces with more and more colour until the normal tint is restored. The obstruction in the front being removed, the smaller branches are able to unload themselves, and when the beneficial action has reached their ultimate radicles the liver-cells clear, and the organ is again restored to function; the charged blood is rapidly depurated, and the urine once more flows freely and clearly, though some time elapses ere the pigment is reabsorbed from the tissues and the appearance of health restored to the patient. This gradual improvement, step by step, is very clearly marked during the administration of the remedy. The first full dose initiates it, and successive doses help it on until the desired effect is attained.

In cases belonging to the Hæmatogenous type, if ipecacuanha is to do any good it must commence its action from the opposite direction: either altering the constitution of the blood itself, or possibly, in some instances, acting on the liver-cells (through the line of the ultimate radicles of the bile ducts?), and re-establishing a function which has by some alteration in the condition of the blood been placed in abeyance.

Whether such an action is possible is doubtful. If it could be shown that the treatment so successful in the first group was applicable also to the second, it would be a great gain to therapeutics. I give a case here which would lend some colour to this possibility.

The element of doubt lies in the difficulty of diagnosis. The case was placed in the Hæmatogenous class, but it possibly may have belonged at first to the other, and have been benefited in consequence of this source of origin.

The patient was a Hindu, a cloth-seller by occupation, age 29, who had suffered for ten or twelve days from malarial fever at Scholapore, and had journeyed from thence with the fever on

him. It was not clear when the icteric symptoms first commenced. On admission (23rd January) his temperature was 104°, tongue rough and dry, with prominent papillæ, skin deeply tinged and of a dingy brown colour, conjunctivæ and mucous membrane of gums yellow, urine porter-coloured, thick and scanty, giving a strong reaction of bile pigment with tests, but no bile acids could be distinguished. Motions passed shortly after admission of *natural colour*; pulse 115, weak and quick; liver not enlarged to any perceptible extent, no fulness of the gall-bladder. The fever proved to be Intermittent Quotidian, and ranged for the first nine days of treatment from 103° or 104° to 96°·4. The patient was restless at first, with delirium at night, then became soporific and dull with muttering delirium. The tongue remained dry and harsh, and the breath was very offensive. The stools were never wanting in colour, the urine continued scanty, about half the normal quantity, contained no albumen, and the chlorides were in normal quantity. There was much tenderness evinced on pressure over the right iliac region. The only complaint he made during his lucid intervals was of intense thirst and much headache.

He was first treated with active purgation, cold sponging at the height of the fever, and suitable food at short intervals. On the 27th I ordered fifteen grains of ipecacuanha with the usual precautions, which he retained three hours. The vomited matter contained bile. The dose was repeated on the 29th. The tongue now became moist, and the colour of the urine altered; it was orange-red rather than porter-coloured. The pulse came down to eighty-four per minute and the delirium lessened. A third dose was given on the 31st. On the 1st of February the report was, "This morning much quieter, no delirium, tongue moist, the icteric colour of the skin less marked, temperature 97°·5." He was now ordered quinine, and there was no subsequent rise of temperature. Some delirium recurred on the following day of a mild character, and the patient was very low and weak, pulse ninety-four, very small, while the tongue had a tendency to dryness. This state was met by constant feeding at short intervals, and dilute nitro-muriatic acid with bark and ether were administered. There was much irritation of the skin.

On the 4th decided improvement manifested itself, the yellow colour had nearly disappeared from the skin and eyes,

while the urine only contained a trace of bile pigment. From this time he steadily improved, and all symptoms of jaundice disappeared.

The distinctive features of this case differ so materially from those of the other group, that the diagnosis admitted of no doubt so far as his condition on admission was concerned; what the condition was previously I had no means of deciding. The chief patho-gnomonic sign was undoubtedly the presence of bile in the stools, undiminished apparently in amount and in the vomited matters. Whatever bile was secreted found its way unopposed into the alimentary canal. The results of treatment seemed to me almost as satisfactory as those I have previously detailed, though they were attained by slower gradations and less distinctness. I am, however, loth to attach importance to the results of a single case, and only quote it here as affording a hope that some at least of the severer cases of jaundice classed under the Hæmatogenous group may possibly be curable by the treatment which, in cases similar to those I have described, included in the Hepatogenous class, I consider to be specific.

NOTE.—Since writing this paper a case has occurred in my practice which appears to me to lend some support to the view I have put forward of the mode of action of ipecacuanha in jaundice, viz., that its action is not solely or mainly on the intestinal tract and thence *by continuity* on the common duct, the gall-bladder and the hepatic ducts, but rather through its general action on the mucous tract, including the gall-ducts; and that probably *after* absorption into the blood. I saw the little daughter, aged three years, of a Parsi lady on the 2nd of October. The child was unwell, listless, heavy, would not play as usual, and had lost all appetite. The bowels were confined rather obstinately, tongue furred. She had suffered from a febrile attack, attributed to cold, a week previously. I ordered saline purgatives. 3rd, the bowels acted sluggishly under the influence of the aperient, the motion being white and clayey. The urine was high coloured, and there was some yellowness of the eyes and skin. Ordered chloride of ammonium and phosphate of soda in full doses. 4th, jaundice more decided. Conjunctivæ quite yellow, skin distinctly so, urine charged with bile pigment and giving a green colour with a few drops of the

iodine solution; stools quite white. There was much nausea, and the little food she was persuaded to take was vomited. She had headache and was very poorly. The mixture was continued, turpentine fomentations were ordered to abdomen and the right hypochondrium, and a flannel bandage, &c. 5th, no better, much nausea, vomiting and prostration, was very restless at night. I determined now to try the effect of ipecacuanha in a full dose, but to give it by mouth was clearly out of the question; I therefore ordered fifteen grains in mucilage as an enema. 6th, the enema had been retained; was slightly better, urine not so greatly charged, the child brighter, motion still white. Repeated the enema, giving twenty grains. 7th, much better, urine quite free from bile pigment (by test), stools (three in number) of a bright yellow colour. Appetite returning, the child asking for food. She did not vomit all the previous day. Slept well. Repeated the chloride of ammonium mixture. 8th, quite well, motions of the natural colour and consistence. The child was very hungry, in fact had a better appetite than she had had for some weeks past.

In this case the remedy could have acted only after absorption into the blood, yet its action seemed as direct and satisfactory as in those cases in which it had been administered by mouth.

Ringer is decidedly of opinion "that the active principle of ipecacuanha enters the blood," and the inference is that it acts through the circulation.

It certainly must do so when it increases the secretion of the mucous membrane of the bronchi. Rutherford in his experiments found that ipecacuanha mixed with bile, and introduced into the duodenum of dogs, was a powerful hepatic stimulant increasing the secretion of bile.

By many this is considered due to its topical action on the common duct as it enters the duodenum, but if its action on the liver is ensured when administered per anum also, this cannot be its *modus operandi*. I think there is little doubt that its action is exerted after absorption into the blood on the whole system of the hepatic ducts from their commencement in their ultimate radicles to their termination by the common duct in the duodenum.

ON CATARRHAL PNEUMONIA AND TUBERCLE IN THE HUMAN LUNG.

BY D. J. HAMILTON, M.B., F.R.C.S. ED., L.R.C.P. ED.,

Demonstrator of Pathology, University of Edinburgh, Pathologist to the Edinburgh Royal Infirmary.

(*Continued from page* 7.)

IN order to get a clear insight into the significance of the giant-cells met with in tubercle, we must take a somewhat general view of the developmental relations of the connective tissues to each other. There cannot be the slightest doubt in the minds of those who have really worked at the subject, that the so-called connective tissues are all built up on the same plan, and that the differences in their outward configuration are merely superficial, and not of fundamental importance, being generally mere adaptations of structure to a special economic purpose. The different forms of white fibrous tissue, cartilage, bone, the cornea, &c., are all instances of tissues derived from the middle layer of the embryo in which the constructive model is the same, but in which certain modifications have occurred, subservient to the purpose for which the particular connective tissue is intended. In one, the matrix, or fully formed part of the tissue, is divided into fibrous bundles, when the particular purpose in view is to act as a means of attachment between two movable parts, as in tendon. In a second, as in bone, this matrix is rendered solid and rigid by impregnation with calcareous salts. In a third, of which cartilage is an example, it is so constituted as to afford an elastic counter-pressure where such is required; while yet, in a fourth, it is of such consistence as to allow light vibrations to pass easily through it; such being the structure of the cornea.

The materials employed in the building up of the connective tissues are chiefly two in number, first, a matrix, and second, nuclei, corpuscles, or cells, as they may be called, which lie upon it, and which subserve the purpose of keeping up its repair. Complicated as may seem the structure of some of the connective tissues, they can all be resolved into these two elements. The matrix is to be regarded as the perfect or formed material, the nuclei or corpuscles are the apparatus by means of which this is manufactured.

The basis substance or matrix is incapable of any further developmental progression, and the pathological changes which it is subject to are all of a retrograde nature. The nuclei, however, being protoplasmic in character, are continually liable to pathological changes under stimulation. To the effects of such stimulation upon connective tissues generally I must now direct the reader's attention.

The whole of the so-called "tumours" may be divided into two great classes. The first comprises those which originate in a structure derived either from the epi- or hypo-blast, and the second includes those which arise in some tissue developed from the meso-blast. The first is known as the class of cancers, while the second is that of the simple histioid tumours and the sarcomata.

From the study of the sarcomata, and of some of the simple histioid tumours, we can derive most important knowledge regarding the significance of tubercle. A sarcoma is a cellular mass, arising from a connective tissue, in which the cells do not elaborate a matrix, but in which they remain in an embryonic condition. They are generally classified under three types, namely, the round-cell, spindle-cell, and myeloid or giant-cell. Such a division is certainly true when the tumour is fully formed, but in the commencement of the development of such tumours it is not so. I hold that in all of them the original type of connective-tissue cell is the myeloid, and that the others merely represent a further stage in the evolution of connective tissues generally.

A sarcoma is nothing more than a connective tissue which has become over-stimulated from some cause. A special feature of the stimulation is its persistence, so that the irritant,

instead of dying out after a certain period, as in an ordinary inflammation, is continuous and apparently accumulative. It looks almost as if the irritant was in reality derived from the sarcomatous elements themselves.

The effect of this stimulation upon the connective tissue is that the completion of a matrix from the cell can never be effected, apparently because the whole energy of the cells is expended in giving rise to a numerous progeny, instead of throwing out the formed material which would constitute the matrix. There is not sufficient time afforded for the secretion of this formed substance, the generative activity of the cell being too great. In this respect they resemble the primordial cells of the embryo, which within a few hours may have multiplied a thousandfold without actually elaborating any truly connective substance.

If careful examination be made of the connective tissue which is in process of being converted into a sarcomatous tumour, the first thing visible is the enlargement of its nuclei. So great is this enlargement at first, that the nuclei, in whatever situation the tumour may be situated, assume the characters of giant-cells. Many of them reach the size of the giant-cells of tubercle, but in others division and consequent multiplication occurs so soon within them that they are almost immediately converted into sarcomatous cells of smaller size. There is always, however, in all such tumours, *a tendency* for the connective-tissue corpuscles to revert to the myeloid type, and hence I conclude that the myeloid or giant-cell is the embryonic type of all connective-tissue cells. It is quite a mistake to suppose that sarcomata connected with bone are the only tumours which exhibit giant-cells. All sarcomata, in their early stages of development, show cells having the giant-cell characters.

In the so-called myeloid tumours of bone the giant-cells have more the character of accessories than that of the real cells of the tumour. The greater part of such tumours is made up of a spindle-cell tissue, and the giant-cells merely represent bone corpuscles which have been set at liberty from their calcareous matrix. They very soon undergo proliferation, just as in all young sarcomata, and are converted into the spindle or small round cells of the tumour.

Hence it is that the myeloid cells are always found most

abundantly in the parts of the tumour near the disintegrating bone. The spindle-cell mass, growing as it usually does from the periosteum, causes absorption of the bone matrix, the bone corpuscles are liberated, and then participate in the general stimulation, so that instead of keeping up the repair of the bone they revert to their embryonic type, and, enlarging, constitute the giant-cells of the tumour. The reason why they are more usual in tumours of bone than in others is, that the bone is only gradually destroyed, and the bone corpuscles are consequently not all set free at the same time; whereas in an ordinary connective-tissue tumour the whole mass of connective tissue in the part is suddenly irritated, and, by the time that it constitutes a tumour, the myeloid type of connective-tissue corpuscle has given place to that of a higher stage of development, namely, the small round or spindle cell.[1]

In Fig. 20, for instance, a cell is represented, taken from a young primary sarcomatous tumour of the parotid gland, which was not connected with bone. Part of the tumour had undergone mucoid degeneration, and this cell was taken from a part in which the jelly-like mucoid was most abundant. The bulk of the cells in the tumour were of a round and spindle type, but those suspended within the mucoid were evidently under specially favourable circumstances for returning to an embryonic condition, and of developing this to its utmost. The jelly-like medium in which they existed no doubt allowed of their freely throwing out processes, and quite possibly supplied nourishment so abundantly as to stimulate them to unusual growth.

The particular cell represented is a typical giant-cell, having branching processes, as in those found in tubercle. The periphery of the cell is the part from which the processes come off, and this presents a formed or fibrous appearance.

In this enormous connective-tissue corpuscle, or giant-cell, I simply recognise a connective-tissue element which has been

[1] I cannot agree with those who suppose that the osteo-klasts, or giant-cells, set free in such bone-tumours, are the cause of the absorption of the bone-matrix. I look upon them much more as the result of its destruction from totally different causes, and regard the giant-cells merely as the bone corpuscles which have been liberated, and which have assumed their original embryonic characters. They subsequently disappear, in sarcomatous tumours, by proliferating, and by assisting in forming the round or spindle cells of which such tumours mainly consist.

unduly stimulated, probably from an excessive amount of nutritive pabulum being supplied to it, and which, from lying in a suitable medium has had every opportunity of developing to an unusual degree. Under such favourable circumstances it has become a giant-cell

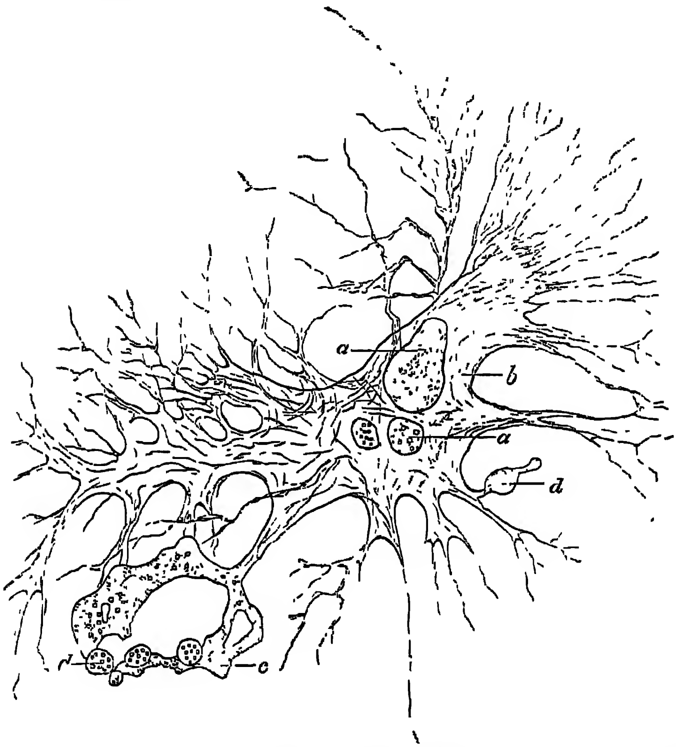


FIG. 20.—Enlarged connective-tissue corpuscle or giant-cell, taken from a young myxomatous sarcoma of the parotid gland, × 450 diams. *a*, *a*, nuclei of the cell; *b*, the outer more formed portion, or periplast; *c*, a portion of the periplast which has still retained its granular protoplasmic character; *d*, ends or offshoots of the same.

Fig. 21 shows another myeloid cell, from a bone tumour, and in this the close resemblance to certain of those seen in young tubercles will be apparent.

Now I will not go so far as to say that tubercle is a sarcoma, but I certainly have very good grounds for asserting that in an early stage of its growth it bears a very close resemblance to this class of tumours. There appears to be formed within the

softening caseous source of infection some substance, possibly a ferment, which, being carried by the blood-stream into an organ, has the power of locally stimulating its connective tissue to great activity of growth. The result of this we have seen in the little mass of connective-tissue elements of which the tubercle, in an early stage of its development, consists (Fig. 19). We have seen, further, that it is from the enlargement of one of these that the giant-cells are formed. That is to say, the portion of connective tissue in this stage is intensely stimulated, its elements become embryonic, and some of them reach the size of giant-cells, or what we have just described as typical embryonic connective-tissue corpuscles. In this stage, the tubercle is essentially a sarcoma.

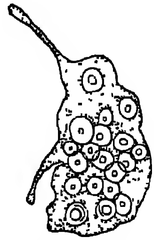


FIG. 21.—Giant-cell, from a myeloid tumour, showing multiple nuclei.

The irritant, however, which has been carried to the part, and which has induced these changes, appears to be of an evanescent character. The stimulation which it excites dies out in course of time. On the supposition that it is a ferment, this would be expected; and then it is that the tubercle loses its sarcomatous character. The stimulation excited is excessive so long as it lasts, and hence the connective-tissue elements very rapidly revert to their embryonic type. It is, however, different from that which excites the proliferation in a sarcoma, in being merely of temporary efficacy, while the latter is permanently present, and appears to increase in intensity.

We have shown that the later changes in tubercle are essentially those of conversion of its cellular elements into fibrous tissue, and that its ultimate destiny is that of a little fibrous tumour. This quite coincides with the theory expressed, of the irritant being of the nature of a ferment, which excites great cellular proliferation while it lasts, but which, when worked out, loses this power, and allows the germinal cells to reach their ultimate development, namely, that of a fibrous tissue.

The reason why the tubercle nodules are isolated at first undoubtedly is, that the irritant derived from the caseous destruction of a part is carried embolically into the organ, and merely excites the connective tissue locally. The fibrous

ultimatum which the tubercles reach is much more common than might be supposed. It only requires the most trivial examination of a chronically tubercular organ to see how many of the tubercle nodules no longer show any typically tubercular structure, but are converted into fibrous tissue. This will be more fully brought out when the subject of secondary tubercle is considered, and it will then be shown that many of the so-called cirrhoses of organs, both in children and in adults, are in reality the remains of a former tubercle eruption.

The conclusions which I have arrived at in regard to the significance of tubercle are:—

1st. That it is merely a form of connective tissue growth.

2nd. That it is caused by an intense irritant acting upon the connective tissue, probably of the nature of a ferment, produced in the softening of a caseous mass

3rd. That this is carried embolically into different parts of an organ, and stimulates them locally.

4th. That the tubercle at first has a close resemblance to a sarcoma, but that when the irritation has subsided, the connective-tissue elements organise and give rise to fibrous tissue.

5th. That the ultimate destiny of the tubercle nodule is to produce a small fibrous tumour.

6th. That the presence of the giant-cells is merely an evidence of the return of the irritated connective-tissue elements to their embryonic type.

The difference between tubercle and a sarcoma is thus quite distinctly marked off, for while, at a certain stage of its growth, tubercle does somewhat resemble a sarcoma, yet its whole tendency, after the irritation has subsided, is to form fibrous tissue. In the sarcomata, of course, it is different, their great distinctive feature being that the cells do not reach full development, but remain in an embryonic condition.

The degenerations and complications of primary tubercle of the lung have not yet been considered; as, however, they will form a fitting sequel to the subject of secondary tubercle of the lung, their discussion will for the present be postponed.

(*To be continued*)

Reviews.

The Student's Guide to the Diseases of the Eye. By EDWARD NETTLESHIP, F.R.C.S., Ophthalmic Surgeon to St. Thomas's Hospital, London. Churchill: 1879.

IN this handy volume Mr. Nettleship furnishes the student with all the knowledge of ophthalmic diseases he need possess unless he is about to make himself a specialist, a proceeding that is on all accounts to be deprecated. No organ of the body can possibly be treated successfully if it be regarded as something separate and distinct from the rest. It may no doubt be urged that the specialist prescribes remedies which are not in common use; yet without a sound and practical knowledge of disease in general, it is impossible that he should know how to apply special drugs, or understand the effects they are likely to produce under different circumstances and in different conditions of the health and state of the body. It is no doubt also true that the specialist employs instruments in the diagnosis of disease which require much practice, but it is not less true that a very large proportion of cases require no more technical skill than can be acquired by any attentive student in the course of a month or two, if we consider that excellent opportunities are afforded for gaining that knowledge with the aid and by the instruction of highly efficient masters at every general hospital both in London and the provinces. In all large towns again institutions exist for the reception of patients suffering from diseases of the eye, or of the eye and ear, and no student who respects himself, and who does not wish to confess inexcusable ignorance, should enter practice without devoting a portion of the last year of his attendance in the wards of the hospital to the diseases both of the eye and ear. A very moderate amount of attention will teach him to recognise what are, and what are not, serious forms of disease; and if in after life he is suddenly called upon to undertake the treatment of a severe attack of iritis or of glaucoma, he will at least adopt those measures which will prepare the way for operative proceedings, supposing these to be subsequently required.

Mr. Nettleship remarks in his preface that several excellent manuals already before the public nearly cover the ground he has taken up, and leaves it to be inferred that it was unnecessary the present work should be written. We do not however agree with him in this point, believing that competition in such matters induces more attention and care to be devoted to each work, since it is certain that the best will distance all its competitors.

A good manual for the student is not an easy book to write. It should be short, clear, and somewhat dogmatic. The more important facts should be placed before the reader in a striking manner, and theoretical and doubtful points be almost ignored. It is better to give too little than to confuse with too much. The size of many of the text-books of the present day seriously militates against their usefulness. In all these points we think Mr. Nettleship's work fairly fulfils the end in view. We have read his book carefully, and have been well pleased with the general accuracy of his statements, the precision of his ideas, and the clearness of his expression. Though his accounts of many affections are much condensed, they do not become a mere dry recapitulation of facts, but are written with the ready pen and illustrative ability of one who is thoroughly master of his subject.

The work is divided into three parts. The first, giving the "means of diagnosis;" the second being the "clinical division," and embracing an account of all the diseases of the eye; and the third describing "the diseases of the eye in relation to general diseases." Some formulæ for lotions and ointments are appended, and there is a good index.

The subject of cysts in the lid is dismissed rather curtly. Cysts are of very common occurrence, and are just the kind of affection for which a patient in the country will apply to his ordinary medical attendant for relief. If the surgeon succeeds in removing it by puncture from the inside of the lid, as advised by Mr. Nettleship, all goes well; but in many cases the cyst is on the outer side of the cartilage, and if it have been allowed to obtain a considerable size it will not always disappear by a puncture or a cut from the inner side, and the surgeon if he fail in his first attempt is discredited. Moreover, even if the contents of the cyst can be thoroughly removed in this way, it easily becomes filled with blood, and for a long time the swelling is nearly as large as at first. We are disposed to think that except in those cases in which the tumour is quite small and close to the conjunctival surface, it is better to remove the cyst by an incision through the skin. If the operation be cleanly done, and the edges brought neatly together with a small needle and fine silk, no mark is left, and the operation leaves nothing to be desired. It is right to say that the author does mention removal

from the outer side, but considers that this should only be done in the rare cases where the tumour points forwards.

In describing the diseases of the lachrymal apparatus Mr. Nettleship states that inflammation of the lachrymal gland, whether acute or chronic, is commoner in children than in adults and, he believes, in women than in men. This statement might lead the reader to think that inflammation of the lachrymal gland was really of common occurrence, whereas it is so rare that Mr. Lawrence in his large experience had never seen a case, and it is rarely mentioned in the hospital reports. We have seen cases of nodes at the outer angle of the orbit which closely simulated chronic inflammation of the lachrymal gland, and have no doubt that a mistake in diagnosis is often made. The diseases of the cornea are well given, though from the manner in which one disease is apt to run into another it is difficult to describe them clearly. The usual methods of treatment are given. We should feel inclined, however, to practise paracentesis of the cornea in all cases where an ulcer is at all refractory to ordinary treatment, and not in those only in which hypopyon or onyx is present. The tapping does no injury if practised with care, and the benefit experienced is often immediate. If the patient be a child, an anæsthetic should be employed. We notice that Mr. Nettleship does not mention eserine, which in some cases proves of signal service when other means have failed.

The chief merit of the book is the care which Mr. Nettleship has devoted to an exposition of the errors of refraction—a subject that is too often slurred over, yet which has during the last twenty years attracted the attention of all engaged in ophthalmic practice to an extraordinary extent. We do not think we are saying too much in stating that the chapters on Myopia, Hypermetropia, and Astigmatism supply the student or practitioner with just that information which will enable him to diagnose and treat sucessfully any ordinary case, and we can confidently recommend these chapters, as we do the work in general, to those who are desirous of obtaining a general and sound knowledge of the diseases of the eye.

Headaches; their Nature, Causes, and Treatment. By William Henry Day, M.D. 3rd Edition, 8vo. pp. 351. London: Churchill.

The rapidity with which this book has reached a third edition shows how well it has been appreciated by the profession. The additions which the author has made are chiefly in the chapters on headache from exhaustion, on nervous headache, neuralgic headache, and the headaches of childhood and early life. These additions tend still further to increase the value of the book.

Clinic of the Month.

The Treatment of Asthma.—Dr. Berkart states that in many cases the asthmatic paroxysms may be speedily removed by the use of pilocarpin. The relief thus obtained is due not merely to the suppression of the painful perception of the dyspnœa, but to the removal, as far as practicable, of its immediate and remote causes. Moreover, the improvement lasts long after the effects of the drug have passed off, and in several instances it was almost complete. Klebs, it appears, has obtained equally favourable results by the same means. "In the very obstinate forms," he writes (*Allg. Wiener Medizin. Zeitung*, No. 1, 1880) "of catarrhal inflammation of the lungs proceeding from cavities, which again and again return, usually accompanied by fever, but occasionally without it, I have never seen a lasting benefit from the use of so-called expectorants. Here pilocarpin, in doses of one-sixth of a grain applied by subcutaneous injection, has rendered the best services." Dr. Berkart also believes that in all cases of chronic pneumonia, in which the nutritive disturbance proceeds from the surface of the bronchi, and gradually spreads to the stroma of the lungs, or in which it commences in the interstitial tissue and implicates the mucous membrane of the air-tubes—whether the process terminate in atrophy or in sclerosis, pilocarpin, provided that the heart offers no contra-indication, will prove beneficial. More speedily, and more safely than any other remedy, it relieves the congestion of the bronchial mucous membrane, favours the expulsion of the obstructing plug of the air-passages, prevents the formation of viscid mucus, diminishes the swelling of the enlarged bronchial glands, and initiates a reparative process, if such be yet possible, in the infiltrated connective tissue of the lungs. To obtain the full benefit which the drug is capable of producing, it should be injected at intervals commensurate to the forces and other circumstances of the patient, until the pathological changes in the lungs are perceptibly improved. (*Brit. Med. Journ.* June 26, 1880.)

The Thermic Effects of Cerebral Lesions.—The depression of temperature which follows acute cerebral lesions in man occurs also in other animals under the same conditions. M. Couty, experimenting upon monkeys at Rio, has found that after gentle anæsthesia, the exposure of the sides of the brain, followed by stimulation of the fronto-parietal zone, suffices to cause a considerable depression of the temperature of the body. The fall is at first slow, then more rapid, and attains its maximum in from two to five hours. It may afterwards fall, and even give place to a rise, but in most of the experiments the animals died during the period of depression. At the moment of death, which was due commonly to arrest of the respiratory and cardiac movements, instead of 37°·9 to 39° C., the ordinary temperature of the animal, the rectal temperature was from 34° to 29°, and in two cases 26° to 25°·4. Thus the depression may occur as a result of slight injuries to the brain, even in an animal comparatively high in the scale, and a very low temperature, thus produced, is not absolutely incompatible with life. The effect, so marked in monkeys, is scarcely to be observed in dogs, which commonly survive the initial disturbances, even if the lesion is considerable. When, however, death occurs during the initial period it is always preceded by the depression of temperature. At the commencement of the fall all the functions of the animal appear to be unaffected; the creature is merely weak and apathetic. The circulation is then altered; the pulse ceases to be perceptible, and any spontaneous movement seems impossible. It still moves, however, if excited to do so, and can walk and defend itself. Later, this susceptibility disappears, often rapidly, and external stimulation only causes irregular reflex movements. Strong faradisation of the sciatic nerve is necessary to cause movements of all four limbs, and ultimately even this fails. Then the respiratory and cardiac movements stop. During these phenomena the changes in the cortical excitability were carefully studied. It was found to be scarcely, or not at all, lessened during several degrees of depression of temperature, even when the animals were comatose and without spontaneous movements, and the excitability continued in characteristic form, although lessened in degree, even when the pulse could not be felt and the temperature of the brain was only 34° to 30° C. Still later, however, the excitability became limited to a small number of points, and much stronger currents caused only movements which were less numerous and complicated. Only when the reflex action of the spinal cord disappears entirely does faradisation cease to affect the cortex. In one case, however, even two minutes after the respiratory movements ceased, there was still an excitable point on the brain. This correspondence in the excitability of the brain with that of the cord and the persistence of the former after

other cerebral functions are lost are remarkable facts. (*The Lancet*, July 10, 1880.)

The Treatment of Acute Œdema—(Beri-Beri).—Sir Joseph Fayrer gives the following directions for the prevention and treatment of this disease, which was epidemic in Calcutta in 1877, and which has recently broken out afresh in the southern and eastern suburbs of that city:—

Proper food, suitable clothing, and protection against vicissitudes of climate, wet and cold, tend to prevent; whilst faulty hygienic arrangements, bad and exhaustive habits, all tend to promote the development of the constitutional condition in which the disease commences. When the disease is established, all these precautions are still necessary, and the symptoms must be treated as they occur. Diuretics and diaphoretics to relieve the œdema and dropsy; tonics and stimulants to give vigour to the weakened muscular fibre; and food and remedies that may improve the condition of the blood.

In the more aggravated and acute cases the indications are the same, and remedies that are calculated to prevent exhaustion or the tendency to fatal syncope and embolism are indicated.

Acetate of potash, digitalis, and squill occasionally (very occasionally, I should say), combined with calomel, are said to favour the removal of the fluid (needless to say that the physiological effect of mercury is to be avoided); salines with the latter may at different stages be found useful.

The object being to remove the fluid and strengthen muscular fibre, iron and other tonics are needed. No treatment will be of much avail if the patient be not placed in favourable hygienic conditions. Among other remedies, Malcolmson speaks highly of two—treāk-farook, and oleum nigrum, procured originally at Masulipatam. They were considered to be very effective in the treatment, especially in relieving the œdema and dyspnœa, which it is said proved very fatal until they were introduced. The treāk-farook is a black electuary, imported (says Waring) from Venice, and is the Theriaci Andromachi of old writers. It is used for other diseases besides beri-beri, such as rheumatism! Mr. Geddes first brought it into notice, and he employed it in combination with rhubarb, cinnamon, cloves, and honey; good food and milk being given at the same time. A similar mode of treatment is advocated by Malcolmson. The composition of the treāk is apparently unknown, but it seems to be stimulating, diuretic, and probably not aperient unless combined with rhubarb.

The oleum nigrum, which is also highly spoken of by Malcolmson and others, is prepared from the seeds of Celastrum nutans,

combined with benzoin, cloves, mace, and nutmeg; it is stimulant and diaphoretic. Given three times a day, it is said to have been beneficial in several cases of beri-beri. There is, I should imagine, no good reason for supposing that these remedies have any specific action beyond the peculiar properties which they probably share with terebinthinates in stimulating capillary action.

No doubt both native and European physicians in India will be able to devise other remedies just as effective. Nux vomica has been found useful in certain cases, and opium may be needed to allay pain and irritability. Hepatic and splenic complications require appropriate remedies.

Obviously the indication is to promote removal of œdema, to regulate the functions of the abdominal viscera, increase the action of the skin; and to give tone and vigour to the muscular fibre, appropriate diet, careful hygienic arrangements, change of locality, and such remedies generally as will tend to improve the condition of the blood. By such measures can we hope to deal successfully with this disease. (*The Medical Times and Gazette*, June 12, 1880.)

Dietetic Treatment of Cancer.—Professor Beneke, of Marburg, *Berlin. Klin. Wochenschrift*, No 2, 1880), repeats a former suggestion of his, to the effect that by dieting patients with cancer, and especially those suffering from its soft forms, with food from which the albuminates, the alkaline, and the earthy phosphates are to a great extent excluded, much may be done to check the abnormal cell-proliferation, and prolong, if not save, the patients' lives. He assumes that cancer-cells are relatively rich in cholestearin, leathin, and the above-mentioned phosphates, and the great source of these is animal food. Hence Dr. Beneke's cancer-diet allows only fifty grammes (barely two ounces of meat), weighed before cooking, per diem, supplemented with a little fish in the form of anchovies, *sardines à l'huile*, or fresh herrings. Butter, sugar, rice, sago, potatoes, cream, nearly all kinds of fruit and green vegetables, are allowed, but bread is given sparingly or replaced by biscuits in limited quantity, and milk is excluded. As drinks, black tea with cream, cocoa, light Moselle or Rhine wines, and occasionally champagne are allowed. Beer, owing to its richness in alkaline phosphates, must only be sparingly taken. Professor Beneke gives a table-diet for each meal in the day, the details of which we have not space to insert. He calculates that by following his rules the normal ratio of the nitrogenous to the non-nitrogenous constituents in ordinary mixed diet—namely, 1 : 5—can be reduced to 1 : 8 or 9. The potassium salts also enter the body chiefly as vegetable combinations, and not as phosphates, and the alkalinity of the

blood-serum is thereby increased so as more nearly to resemble its condition in the herbivora, in whom, Professor Beneke remarks, cancer is very rare. In answer to the possible question, "Can a man exist on a diet so deficient in nitrogen and phosphates?" he quotes the *ipsissima verba* of several patients in the affirmative. One of these, an Englishman (affected, however, not with cancer, but with rheumatoid arthritis), has persevered in it for six years, with gain of weight and muscular force, as well also, according to his own statement, of mental vigour. As to the practical value of the method there is at present little to be said. Professor Beneke can muster only eight cases in which it has been tried—five by Esmarch and Oldekop, and three by himself. Two of the five were too far advanced for operation, and soon died; two others also died after several operations. The fifth—a simple cancer of the breast, which was also treated with liquor arsenicalis—was operated on without relapse. Beneke's own three cases were all alive at the last report. It would be easy to try the diet on a large scale either at the Cancer Hospital or in the cancer wards of the Middlesex Hospital, but, as Beneke insists, it must be strictly carried out, and the theoretical principles on which it is founded must be steadily kept in view by the surgeon in charge. To those patients who require more fat than is prescribed in the diet-table, and who cannot tolerate butter, cod's oil may be given. Those inclined to corpulence should take small doses of Carlsbad salts regularly during the "cure." In conclusion, Beneke points out that if, as is probable, the cancerous and the scrofulous diatheses are in many ways diametrically opposed to each other, what his dietetic system seeks is to reduce the former to the latter. (*The Med. Times and Gazette*, June 26, 1880; *Berlin. Klin. Wochenschr.*, No. 2, 1880.)

Treatment of Infantile Syphilis.—M. J. Simon, in a course of lectures upon the therapeutics of infancy, delivered at the Hospital for Sick Children in Paris, states that mercury is of real use in infantile syphilis. He advises that the following course of treatment should be rigorously carried out. The child must be rubbed morning and evening with Neapolitan ointment, the friction being made alternately in the axilla, groin, and popliteal space Four times a day five drops of the Van Swieten's liquor should be administered in a little milk, the dose being increased if necessary to thirty or forty drops per diem. A wooden spoon or a porcelain cup should be employed to contain the liquor, since silver soon becomes covered with an amalgam which causes an alteration in the mercurial preparation. This treatment should be continued for some months, the quantity of mercury given being progressively raised and lowered. (*Le Progrès médical*, July 3, 1880.)

Gurgun Balsam in Gonorrhœa and Vaginitis.—This balsam, which is extracted from various dicotyledonous trees, is turbid and of a brown colour, bitter, smelling like copaiba but with a less unpleasant odour, whilst it is less acrid and less expensive than this drug. It is also more readily tolerated. After being in use for a long period in India, its properties were carefully examined by M. Vidal in Paris, as well as by M. Mauriac and M. Malley. The balsam is administered in capsules or in the form of an emulsion in mucilage. In the latter form Vidal gives 4 grams a day, immediately before meals ; in larger doses of 10-12 grams it produces vomiting and diarrhœa. It can be prescribed at the beginning of a gonorrhœa, which it cures in 15 to 20 days : it is better however to employ it when the inflammatory stage is over, but it is also very useful in gleet. In the female it is used as a local application, the vagina being first washed out with warm water, a plug of cotton-wool soaked in a liniment of equal parts of balsam and lime-water is applied by means of the speculum, and the plug is then covered with a second one of dry

wool, the dressing being renewed daily. This proceeding is attended with a slight smarting which disappears after the third application. (*Bouchut's Compend. Ann. de Thérapeutique*, June, 1880.)

The Treatment of Acute Pneumonia in Adults by Digitalis and Alcohol.—Dr. Albert Joly (*Revue Médicale de Toulouse*, July, 1879, and *Bulletin Général de Thérapeutique*, May 30) gives an account of the results obtained by Dr. Alix in the military hospital at Toulouse, by the use of digitalis and alcohol in the treatment of pneumonia. He arrives at the following conclusions:—1. The gravity of either simple or double pneumonia, if uncomplicated, is nil, if its normal evolution and its natural tendency to recover be not disturbed by ill-timed medication 2. Its affinity with the eruptive fevers (internal herpes of some writers) seems to be confirmed by its very regular progress, of which the proof is given by tracings 3. Pneumonia is an essentially debilitating disease, in which the temperature falls below the normal rate more than in any other inflammatory disease. It evidently results that the chief indication is to combat this debility, and to strengthen the organism by stimulants, notably by alcohol, which is also an arrester of waste. Nevertheless, as the temperature, even by its rise, often constitutes a danger, it is necessary to anticipate it, not by venesection nor by tartar emetic, which agitate and weaken the patient, but by digitalis, the advantageous effects of which cannot be denied. 4. Every fresh cause of hyperthermia should be carefully avoided from the outset, and consequently cupping must not be allowed, as by the wound it produces and the accidents it brings on it raises the temperature in a notable way. 5. Pulmonary exudative repletion, which creates a danger by its abundance, must be carefully avoided; consequently opium, which favours it, must not be given. It also results that cupping must be avoided, as by immobilising the chest it obstructs expectoration. These conclusions are, it is stated, confirmed by the consideration of the results obtained. (*The London Medical Record*, June 15, 1880)

Oxide of Zinc in Diarrhœa.—M. Cousin publishes in the *Marseille médical*, a paper which confirms the excellent results obtained by Gubler and Bonamy from the use of oxide of zinc in diarrhœa. The majority of cases treated were obstinate and chronic, characterised by abundant and numerous dejections; some were due to simple intestinal catarrh, whilst others were caused by improper food or by cold, others again being symptomatic of tuberculosis. In each case various remedies (opiates, astringents, anti-cathartics, &c.) had been employed without result. M. Roux resorted finally to oxide of

zinc, which yielded marked and rapid effects; thus diarrhœa of six, four, and three months standing, was favourably modified within a few days after the administration of the first doses of this remedy. The formula employed, which is the same as that of Gubler and Bonamy, is as follows:

Oxide of zinc, 3 grams 50 centigrams.
Bicarbonate of soda, 0 grams 50 centigrams.

Make into four powders, one powder to be taken every three hours. The union of the soda bicarbonate with the oxide of zinc causes the latter to be more readily tolerated. (*Le Progrès médical,* July 3, 1880)

The Therapeutic Use of Pancreas.—All attempts to utilise in a therapeutic sense the very active properties of the pancreatic juice have hitherto failed. This want of success, according to Engesser (*Deutsches Archiv für klin. Med.*, band xxiv. p. 539, and *Gazette Hebdomadaire*), is owing to the necessity by a natural tendency of first isolating the ferments, in order to administer them afterwards in the pure form. These isolated ferments being destroyed by the pepsin of the stomach in normal digestion, the only field left for their use is the very limited one of the large intestine. The pancreatic parenchyma, or even the fresh watery extract, on the contrary, retains its digestive properties whilst passing through the stomach. This point, though difficult to explain, is supported by numerous observations and experiments. Unfortunately, patients take the pancreas cut into small pieces, or pounded and passed through a seive, with the greatest repugnance. To avoid this serious drawback, since the use of the pancreas should be greatly prolonged, the author has had many preparations made. He finally settled on the following method. The gland, cut in small pieces, was reduced in vacuo at 104° Fahr. to an extract, then treated during forty-eight hours by absolute alcohol, which is afterwards carefully evaporated. A coarse light brown highly hygroscopic powder is thus obtained, which patients take without disgust, and which possesses all the qualities of the fresh watery extract. If clinical observations be consulted, it will be found that the action of the pancreatic juice is clear enough, but that the indications for it remain very limited up to the present time. Fles published in 1864 the case of a diabetic patient, who ate a great deal of meat and fat, and in whose stools a quantity of fatty matter and muscular tissue were found in an unchanged condition. The use of the pancreatic juice caused these undigested fragments to disappear immediately, but they reappeared directly the administration of the drug was left off. This remarkable observation may be considered as a type of the circumstances in which the pancreatic

parenchyma may be usefully employed. Engesser has obtained good results in cases of acid dyspepsia, etc., whenever the presence of undigested muscular fibres is detected in the egesta. The use of pancreatic juice has in every instance removed these fragments, but produced very slight improvement in these essentially chronic diseases. (*The London Medical Record*, June 15, 1880.)

Dyspepsia in Infants.—Dr. Steiner recommends in his *Compendium* of the diseases of children the following formulæ, which he has often employed with good results in the treatment of dyspepsia in young children. Dyspepsia, the result of overloading the stomach with difficultly digestible and badly assimilated foods, is a condition which is frequent in those who are brought up by hand. The treatment of such cases requires careful attention to diet, and where there is an excessive acidity of the stomach, magnesia and bicarbonate of soda may be employed as follows:

Sodæ bicarb. 0·20—0·50 centigrams.
Aq. destill. 80 grams.
Syrup simpl. 10 grams.
Sig. A desertspoonful every two hours.

In those cases in which there is excessive alkalinity on the other hand, acids in a very dilute form are specially indicated, and of these more especially hydrochloric acid:

Acid hydrochlor. dilut. gtt. x.
Aq. destill. 70 grams.
Syrup simpl. 10 grams.
Sig. A teaspoonful every two hours.

With very young children a dose of a centigram of pepsin may be administered before each meal.

The dyspepsia of older children, due to improper diet, can sometimes be quickly cured by an emetic and strict attention to diet. Colic of a dyspeptic character may often be cured by the employment of the following:—

Sodæ bicarb. 0·50—0·80 centigrams.
Aq. fœnicul. 80 grams.
Syrup diacod. gtt. xv.
Sig. A teaspoonful every two hours.

If there is constipation this mixture may be ordered:—

Hydromel 40 grams.
Aq. fœnic. 40 grams.
Aq. lauroceras, gtt. xv.

Sig. A tea-spoonful to be taken every half hour until the medicine acts. (*Le Progrès méd.*, July 10, 1880.)

The Treatment of Spina Bifida.—M. Blachez, in a lecture upon a case of spina bifida which had been treated by the injection of alcohol, alluded to a plan of treatment which had been employed by a doctor in Chicago, and which he thought was worthy of mention, as the author stated that he had obtained numerous favourable results from it. The indications and contra-indications are the same as in other cases, or in those treated by injections. The surgeon first removed from the sac 100-200 grams of fluid, which he carefully maintained at the body temperature; he then injected the following solution into the tumour:—

Aq. destill. grams 30.
Tinct. iodi. centigrams 0 25.
Pot. iod. centigrams 0·75.

The solution is allowed to remain for some time in the sac, after which a quantity of fluid, corresponding in amount to that which was injected, is allowed to flow out, and in its place there is re-injected into the tumour the fluid which had previously been withdrawn and kept at the heat of the body. (*Journ. de Méd. et de Chir. pratiques ; Le Progrès médical,* July 17, 1880.)

On the Feeding of Infants during the First Nine Days of Life.—Dr. Carl Deneke of Jena contributes a paper upon this subject to the *Archiv. f. Gynækologie,* bd. xv. hft. 3, p. 281. The inquiry is executed in a manner which is peculiarly clear and convincing. After a brief historical reference to the limited literature devoted to this subject in France and Germany, special reference being made to the works of Bouchaud, and Bouchut in France, of Bartsch, Kruger, and Ahlfeld in Germany, the author proceeds to explain the manner in which his own observations were conducted. This was as follows:—The newly-born child was accurately weighed when quite naked, immediately after it had been washed for the first time. These weighings were subsequently repeated in the naked condition every twelve hours in some cases, every twenty-four hours in others, to determine in what relationship the increase or decrease of the absolute weight of the child stood to the nourishment taken in. After the first bath the child was clothed, and both mother and child put to rest. Food was not offered to the child until on awaking it cried for it, or until it made attempts at sucking its fingers. Before the child was put to the breast, or the bottle given to it, it was completely undressed and weighed. This weight, and also the moment when it began to drink, were accurately noted down. The child was then, in the presence of Dr. Deneke, kept at the breast until it would drink no more, and let go the nipples, or went to sleep. When the child drank only

for a short time, and it was suspected that it was not fully satisfied, measures were adopted to tempt the child to drink yet more. Furthermore, the children were not put to the breast until they awakened again out of sleep, cried, and made attempts to suck their fingers, or otherwise gave such evidence of need of food as could not escape the attention of an experienced or careful mother. The weighings before and after each feeding were executed in all cases with the same accuracy as on the first occasion. If a child was artificially fed, the bottle with its contents was weighed before and after it drank, but in this case even the frequent weighings of the child as a check on the observations were not omitted. The children were fed by bottle when the mother's breast afforded no nourishment and no other wet nurse could be got In the artificial feeding condensed Swiss milk, diluted with twelve parts of boiling water, was used, which mixture should be about equal, on an average, in feeding qualities to the mother's milk. The weighings were executed with very sensitive balances. Ten cases thus observed are then recorded at length in tabular form, each of which cases was under observation for nine days. The tables consist of six columns. On the first column is given the day on which the observations were made; on the second, the exact periods at which the child was put to and removed from the breast during that day; on the third, the weight of the child after it had drunk; on the fifth, the difference between the two former weights, giving the weight of milk taken by the child at each drink; and on the sixth column are given observations as to the breast drunk from, how the child behaved, whether it passed water or had the bowels moved during drinking, or whether it vomited, etc., etc. The results obtained are subsequently presented in a condensed tabular arrangement, under the headings—1st, name and weight of the child after birth; 2nd, the day of observation; 3rd, the changes of weight of the child; 4th, the amount of milk taken each day; 5th, the minimum amount of milk consumed at each meal; 6th, the maximum of milk consumed at each meal; 7th, the average amount of milk consumed at each meal; 8th, the percentage amount of milk consumed each day in comparison to the weight of the child's body; 9th, the number of times the child was put to the breast daily. (*Edinburgh Medical Journal*, April, 1880.)

Diagnosis of Cancer of the Stomach.—M. Leven pointed out, at a recent meeting of the Society of Biology, in Paris, the great difficulties which often present themselves in practice in making a differential diagnosis between cancer and simple dilatation of the stomach. In both cases there is vomiting,

which is said to be uncontrollable; to stop this symptom, M. Leven recommends that solid food, to the amount of 150 grams, should be given to such patients only once a-day, in order to avoid congestion of the mucous membrane. The rest of the food for the twenty-four hours should consist of a litre and a half of milk and six eggs. If after eight days of this diet the sickness has ceased, it is certain that there is no cancer of the stomach. (*Le Progrès médical*, May 29, 1880.)

On the Therapeutic Uses and Toxic Properties of Pyrogallic Acid.—M. Neisser (*Zeitschrift für Klin. Med.*, bd. i. p. 88) reports a fatal case in contradiction to the reassuring statements which have been made of the harmlessness of pyrogallic acid. The patient, a strong man, aged 34, attacked with universal psoriasis, two hours after one-half of his body was rubbed with rhubarb ointment (for comparison), and the other with pyrogallic acid ointment, felt himself very uncomfortable; then followed shivering, malaise, vertigo, collapse, torpor, coma. The temperature was 40·1 C. (104·2 degrees Fahr.); pulse, 96 to 120; urine very dark, free from albumen. Shortly before death, which followed in eighty-four hours, the urine—which during the whole duration of the illness only amounted to 1,600 cubic centimetres—showed the highest degree of hæmoglobinuria. The post-mortem examination confirmed the diagnosis of dissolution of the blood. In consequence of this important case, the author instituted a series of researches on animals, which showed that rhubarb in any form, as well as chrysophanic acid, is harmless; that even in very large subcutaneous doses (10 to 15 grams), the colouring matter indeed appeared in the urine, but the animals remained healthy, even as regards the local phenomena in the spots injected. On the other hand, pyrogallic acid showed itself to be an intense poison. In small doses it is decomposed by the alkaline blood, and absorbs a part of the loosely combined oxygen with discoloration of the blood. In large doses it destroys the red blood-corpuscles, and changes the character of the blood so that circulation becomes impossible; it also causes hæmoglobinuria with formation of pigment-cylinders in the urinary tubes, and often in this way rapidly produces death. The anuria resulting from the obstruction of the urinary tubes is too short in duration to make death from accumulation of the injurious urinary elements a possible contingency, but the closure of many uriniferous tubules favours the retention of the pyrogallic acid in the urine, and thus increases its toxic effect. On this account diuresis must be excited as much as possible, and in case of need the damaged composition of the blood must be repaired by transfusion. In any case, it follows from these clinical and experimental observations

that the use of pyrogallic acid is to be prohibited in all cases where large parts of the surface of the body are to be treated as in universal psoriasis; it can, on the other hand, be employed without mischief for smaller surfaces of skin (psoriasis of the head and face; lupus; epithelioma). Rosa Engert has had good results with pyrogallic acid, used as a local irritant, not only in skin-diseases, but in cancroid of the vaginal mucous membrane. (*The London Medical Record*, February 15, 1880.)

The Night Sweats of Phthisis.—Dr. Kohnhorn reports two cases which had resisted the successive employment of quinin, atropin, digitalis, boletus caricis, folia salviæ, and various external lavements, frictions, inunctions, &c. These cases were quickly cured by the external application of a powder prepared after the following formula:

℞ Acid. Salicyl. gr. 48.
Amyl. ʒijss
Talc earth ℥iij.

M. F. pulv.

The entire surface of the body is powdered over with this preparation. To avoid the excitation of coughing by the salicylic acid, patients are directed to apply a handkerchief to the nose and mouth during its application. The same powder has been employed in the army for the treatment of hyperidrosis of the feet. (*Berl. klin. Wochensch.*, No. 1, 1880; *The New York Medical Record*, March 13, 1880.)

Iodoform in the Treatment of Goitre.—Dr. Boéchat believes that iodoform, dissolved in sufficient quantity in some indifferent fluid, may be successfully employed in the treatment of goître. In injecting into the tumour better results are attained than with the tincture of iodine, and there is no fear of the subsequent complications so frequently met with after the employment of the latter method, and which are due to the formation of cicatrices, owing to the action of the alcohol upon the tissue of the thyroid body. The chief objection to the use of iodoform has always been its acrid and penetrating smell. This objection, when employing it for external use, Dr. Boéchat has sought to overcome in the following manner. The iodoform has been finely powdered, and has then been intimately mixed with glycerin, the mixture being applied to the goître. As soon as it has begun to dry the part is painted over with collodion, which dissolves a small quantity of the iodoform by means of the ether which it contains. The plan is not very successful, however, as it only masks a part of the odour. The application is to be made every two or three days. In cases of goître of

long standing, and in cystic and parenchymatous forms, no results have been obtained by this method of treatment, but in the cases of young patients, and in goîtres of recent growth which consisted of soft non-fibrous swellings, very marked results were obtained; the goître disappearing more rapidly than with iodine or potassium iodide. Iodoform administered in internal doses of pills, each containing 0·01 gram, to the extent of ten pills per diem, has not given any very satisfactory results. (*Correspondenz Blatt. f. Schweiz. Aertzte,* Jan. 1, 1880.)

Treatment of Scarlet Fever.—Archambault gives the following directions for the treatment of scarlet fever:—

Hygienic.—An airy room, no more than the ordinary covering; keep the patient in bed as long as possible, even though the malady seems to have terminated about the seventh or eighth day, when desquamation begins; precautions against taking cold for three or four weeks, for nephritis, which commences from the twelfth to the twenty-third day, rarely comes on after the fourth week. Cover the articulations well, as they are frequently subject to rheumatism or arthritis. The patient should not go out before the sixth week. Baths after the third week. To allay itching, cold-cream and glycerin, or simple dusting with starch powder. Restricted diet at first; more nutritive diet after the fever recedes. *Medical Treatment.*—If the eruption is long in appearing, borage-tea and a potion of (ʒss.) 2 grams of acetate of ammonia in (℥iv.) 125 grams of mucilaginous mixture. Correct constipation with castor-oil or rhubarb. When the eruption is free, give emollient or cooling drinks. If delirium comes on, give bromide of potassium.

Bromide of potassium, ʒss-j. 2 to 4 grams.
Syrup of cherry laurel, ℥ss. 20 grams.
Syrup diacoccymelon, ʒiijss. 10 grams.
Hydralate of tilia, ℥iij. 100 grams.

of which the child takes a tablespoonful hourly. *Treatment of the Angina.*—Chlorate of potassium as a gargle, or in younger children in the form of pastilles or mixed with sugar. Caustics are useless. The physician should exercise a rigorous surveillance, even in the simplest cases in appearance, as they may be followed by nephritis, endocarditis, or articular rheumatism. (*Le Praticien,* No. 2, 1880; *The Chicago Med. Journ. and Exam.,* April, 1880.)

Bibliography.

Lehrbuch der Kinderkrankheiten. Von Prof. Dr. Alfr. Vogel. 8. Aufl. 8vo. pp 548. Stuttgart: Enke

System der Gesundheitspflege. Von Bez. Phys. Prof Dr. Ludwig Hirt. 2. verb. u. verm. Aufl 8vo. pp. 232. Breslau: Maruschke und Berendt.

Die Bader u. klimatischen Kurorte der Schweiz. Mit e Bäderkarte der Schweiz. Von Dr. Th. Gsell-Fels. 8vo. pp. 524. Zurich: Schmidt.

The Waters of Kreutznach. A Work for General Readers. By Dr. Charles Engelmann, revised and in part rewritten by Dr. Fred. Engelmann. 8vo. pp. 122. London. Kreuznach: Voigtlander's Sort.

On Aneurism. By Richard Barwell, F R.C.S. 8vo. pp. 118, with illustrations. London: Macmillan and Co.

Brain and Nerve Exhaustion. By T. Sketch Dowse, M.D. 8vo. pp 69. London: Baillière, Tyndal, and Cox.

Atlas of Obstetrics and Gynæcology. By — Martin. Translated and edited, with additions, by Fancourt Barnes, M.D., Physician to the British Lying-in Hospital, &c. Small folio. 98 full-page plates with letter-press description, 409 figures, of which 37 are coloured. £1 11*s*. 6*d*. London: H. K. Lewis.

On Deafness, Giddiness, and Noises in the Head. Second edition. By Edward Woakes, M D. Crown 8vo. pp. 224. 17 wood engravings. 7*s*. London: H. K. Lewis.

Royat-(les-Bains), its Mineral Waters and Climate. By G. H. Brandt, M.D. Preface by Dr. Burney Yeo. Crown 8vo. pp. 29. Frontispiece and map. 2*s*. 6*d*. London: H. K. Lewis.

On the Bile, Jaundice, and Bilious Diseases. By J. Wickham Legg, F.R.C.P. 8vo. pp. 719. 4 coloured plates. 25*s*. London: H. K. Lewis.

On Slight Ailments, their Nature and Treatment. By Lionel S. Beale, M.B., F.R.S. 8vo. pp. 244. 5*s*. London: Churchill.

Practical Lithotomy and Lithotrity Third edition. By Sir Henry Thompson, F.R.C.S. 8vo. pp. 304, with engravings. 10*s*. London: Churchill.

Medical Education and Practice in all Parts of the World. By H. J. Hardwicke, M.D. 8vo. pp. 209. 10*s*. London: Churchill.

*** Any of the foreign works may be procured on application to Messrs DULAU, of Soho Square, W.C.; WILLIAMS and NORGATE, of Henrietta Street, Covent Garden, W.C.; or BAILLIÈRE, of King William Street, Charing Cross.

ON REMOVAL OF TROOPS AND PRISONERS INTO TENTS IN INDIA IN EPIDEMIC CHOLERA.

BY SURGEON-GENERAL JOHN MURRAY, M.D.

I AM anxious to submit the following remarks on the subject of removal into tents in epidemic cholera.

The statistical papers I now desire to bring to notice furnish valuable facts in the history of cholera in India since the beginning of the present century. They contain information which confutes some prevailing theories, and show that we can, not only employ means to avert the disease, but that we can also employ means to remove it.

Cholera scarcely appeared in the medical returns from whence these tables are drawn, up to the year 1817, when a sudden severe outbreak took place in Bengal, and rapidly spread all over India. The disease has continued to appear, at irregular intervals, up to the present time in all the provinces. Returns have been regularly furnished to Government from the European troops, Native troops, and Native prisoners, and these furnish the basis of these tables. They commence in 1803 in Madras and Bombay, and in 1814 in Bengal. Cholera appears to have been entered under the head of some *other diseases*, previous to that date. The mortality shown varies considerably in the different Presidencies, particularly amongst the European troops and Native prisoners; but it continued high until the year 1862; since which time there has been a marked diminution. To indicate the cause of this saving of life, and to show that it is contingent on the

[1] A paper read before the Epidemiological Society.

removal of troops and prisoners into tents on the appearance of an epidemic, is the object of the present paper.

My experience of the benefit of removal commenced while I was in charge of the Central Prison at Agra; where I witnessed its good effects on the Native prisoners. In 1851 there was a severe attack of cholera amongst them. It appeared on the 25th July, and the last case occurred on the 29th August, having lasted 36 days. On the 30th July about one-half of the prisoners (1,400) were moved from the jail into the ancient buildings at Secundra, the Taj, and the Ram bagh. From the 30th July there were 54 cases and 16 deaths amongst these; whilst amongst the 1,500 who remained in the jail there were 199 cases and 59 deaths.

In 1856 there was another very severe attack in the same prison. Six cases of cholera were sent into the hospital from a local jail in the city, on the 23rd and 26th May. The first case among the prisoners occurred on the 30th May, and the last case on the 20th July. There were 50 cases, and 21 deaths up to the 12th June. Six hundred men were moved into the old buildings in the vicinity, on the 13th June, and 500 more into tents on the 28th June, and 700 more on the 3rd July. Out of a strength of 3,704, there were 349 cases in the jail, and 215 among those sent out, with a total mortality of 239.

In 1860 there was a very severe attack of epidemic cholera at Agra, in which the European troops suffered much, and I moved them into the old buildings which had been occupied by the prisoners in the years 1851 and 1856, as well as into tents. This prevented the buildings being available for the prisoners who were attacked with great intensity on the 8th August. In consequence of rain they were not removed into tents until the 25th August. During these 16 days there were 754 cases, and 158 deaths. On the 26th there were 30 cases, but in the following 7 days there were only 38 cases, and only 3 more up to the 8th September when the disease disappeared. Out of a strength of 2,063, there were 807 admissions and 172 deaths. The delay in moving into tents was much to be regretted, as the danger from exposure, anticipated by the Superintendent, was not shown to exist by the experience of the European troops

who were moved into tents at that time, during the rainy season. In 1861, another severe attack took place in the same Central Prison. It broke out on the 7th July and lasted till the 10th August—35 days. Eight hundred and fifty of the prisoners were moved into tents on the 10th July, after 50 cases had appeared, and there had been 16 deaths. There were only 4 cases in the camp. Out of a strength of 2,959 there were 173 cases and 65 deaths.

In 1862 there was a mild attack in the Agra prison. The first case was on the 10th August, and the last on the 18th, a total of nine days. The prisoners were moved into tents on the 12th, and the disease subsided. There were in all, out of a strength of 2,667, 23 cases and 12 deaths.

In 1856, at Agra, during the attack which I have described in the Central Prison, the cholera epidemic was very severe amongst the European troops in cantonments. I suggested to the Superintending Surgeon, that they should be moved into tents, and after a medical consultation some of them were marched to the Ram bagh. But the tents did not arrive till 12 or 1 o'clock, and the men were exposed to a bright August sun. The cholera subsided, but cases of sunstroke were numerous; there were upwards of 50 during that and the following day. The men were therefore recalled to cantonments, and the measure of removal strongly condemned. The failure I attributed to mismanagement, in not having the tents ready to receive the men.

In 1860 I was Deputy Inspector-General at Agra, and on the outbreak of cholera in cantonments amongst the European troops, I recommended the officer commanding the brigade (General Showers, C.B.), to remove the regiment into camp. He pointed out the unfavourable result of the movement in 1856; but at the same time said "it was a medical question, and that what I advised he would carry out, only I must recollect the responsibility would rest entirely on me." This I accepted, and the troops were immediately moved into tents. The result was highly satisfactory, contrasting favourably with that of the movement in 1856, and also with the course of the disease at the same time in the Central Prison before the prisoners were moved into tents, as previously detailed.

At this time the disease was very severe amongst the European

troops at Muttra, and General Showers requested me to visit that station, which I did the next day. I found that the European artillery there had been decimated during the previous week. Twelve out of 14 cases had proved fatal, and another in hospital was dying. The medical officer said that medicine had no power to check the disease. I advised the troop being moved into tents, which was done that afternoon, and afterwards there was only one slight case, which recovered. It was on this occasion that I took a hint from a mistake which had occurred at Agra a few days before. A company of the 3rd battalion Rifle Brigade had been sent into camp, and I had given a box of cholera pills to the serjeant-major who accompanied it, with instructions to give one to any man who went to the rear after gunfire. On inquiring next morning how many pills had been expended, "I used them all, sir," said he with a military salute. "All?" said I—"Yes, sir; served them out to each man with his grog." At this there was a laugh at my expense; but the effect had been so good (for there was not a case of cholera in the detachment afterwards), that I employed the same measure with the Muttra troop of Horse Artillery; and continued the plan in subsequent epidemics. It invaribly secured the men a sound night's rest, and doubtless aided nature in eliminating the poison from those in whom it was present in a dormant state. During this attack in 1860, the 3rd battalion Rifle Brigade, out of a strength of 1,000 had 220 cases and 57 deaths. The first case was on the 9th August, the last on the 13th September—36 days. They had improved at first after removal, but there was a severe recurrence on the 30th August. The battery of artillery at Agra, at this time, out of a strength of 120, had 27 cases and 7 deaths.

In 1861 cholera appeared among the European troops at Agra on the 18th July. It became severe on the 24th and 25th (there were 9 deaths on the 24th, 8 on the 25th). They would have moved into camp on the 26th, but rain poured down incessantly. During a break, on the morning of the 27th, H.M's 42nd Regiment moved from their barracks to the corridors round Akhbar's tomb at Secundra. There were 2 fatal cases on the day they moved out, and 1 on the next day. On the 30th they went

into tents. There were no more fatal cases. Out of a strength of 412 there were 47 cases and 24 deaths.

This epidemic was very severe in the cantonment of Gwalior (Morar). The first case appeared in H.M's 27th Regiment, on the 24th July, and it became severe on the 25th. The men were moved into tents for the day, near the parade-ground on the 30th, sleeping in their barracks at night. The disease continuing severe—97 cases and 72 deaths. On the 8th August the regiment was marched into a camp on high ground about four miles off. There was considerable improvement for several days; but the disease again increased until they changed ground to the opposite side of the cantonments on the 18th August. In doing this they passed through the station and slept for two nights in their barracks. On the 19th and 20th there were 17 cases and 14 deaths. The camp then changed ground every third day; and the disease rapidly subsided and disappeared on the 14th September. Out of a strength of 1,166 there were 209 cases, and 158 deaths.

The measures of removal, which I had advised and thus carried out, were guided by the principle that cholera is communicable from the sick to the healthy, either directly or indirectly, by vitiating the locality in which they reside; and the remedy consists in removing the healthy from that locality and isolating the sick. This is effected in the most thorough manner by removal into tents, and afterwards by frequent changes of ground, to short distances, until the disease entirely disappears. Special hospitals for cholera patients are necessary. Removal was thus effected under my direction with successful results, notwithstanding the season of the year. It was only necessary to avoid marching the men on a rainy day, and guard against direct exposure to the sun in the hot season.

The epidemic of 1861 was very general in the N. W. Provinces and the Punjaub, and the mortality amongst the European troops extremely high. A Special Commission was therefore appointed by Government, to investigate and report on the subject, of which Mr. (now Sir John) Strachey was President. They made a minute and searching investigation, and the result was that they approved the measures of removal that had been adopted at Agra; and recommended the issue of

regulations enforcing the same in future, on the appearance of similar epidemics amongst the European troops in India.

These regulations were much objected to in the years that followed, by several parties; and in 1868 a Special Commission was appointed at Simla to revise them, of which I was a member.

The medical objections urged before the Commission were that removal was needless, as the disease was not contagious; and that it was dangerous, as living in tents during the hot and rainy seasons was likely to induce other diseases—as sunstroke, fever, and dysentery, which are as fatal as cholera; and to which the men are less liable in barracks.

In answer to these objections it was stated that no increase of sickness had hitherto been induced by removal when properly conducted; that on the contrary there had, in many cases, been a decided improvement in the health of the men, and their health subsequently had been better than that of the men who had remained in cantonments.

Objections were also urged against removal by the military authorities. They did not approve of the responsibility of taking this measure resting with the medical officers—but as it is a medical question, it was thought that that department was best qualified to form an opinion of its necessity.

Other objections to removal are of great practical importance. It gives great and serious trouble to executive officers, who have to make the arrangements. The officers with the regiment suffer much inconvenience and discomfort in moving from their houses into tents, in the hot and rainy seasons. The liability to be recalled from temporary leave is also disagreeable. These are doubtless all real objections; but when the measure in question is for the benefit of the men they must be set aside. The expense of removal is certainly considerable, but that is more than compensated for by the saving of life among the soldiers.

A return of the instances of removal that had taken place the previous year (1867) shows that out of 198 instances, in 118 there had been no case of cholera after removal, and in only fifty-nine instances had there been any case after the fourth day.

The deliberations of this Commission were followed by the revised regulations, published in G. O. G. G., No. 129, dated August 3rd, 1870, and will be found in the Sixth Annual Report of the Sanitary Commissioner with the Government of India. They differ in no essential point from those previously issued, but are more complete in details, which further experience had proved to be useful. These details comprehend the strictest attention to all sanitary and hygienic rules, enforce the selection of high and well-drained ground, the camp to be frequently changed and to be, if possible, near trees. If the troops can be taken across a river the advantage will be great.

The injurious effects following deviation from these regulations indicate the soundness of the principles on which they are founded. The most prominent sources of danger being, first, delay in removal, arising from the non-recognition of the disease; second, deficiency in tents or their transport; third, remaining too long on the same ground; fourth, low, damp site for camp in the rainy season; fifth, exposure to the sun; sixth, too long marches; seventh, occupying ground previously vitiated by the presence of a cholera party; eighth, inattention to the treatment in the preliminary or early stage of the disease. Delay in removal may be considered a valid excuse when the surgeon does not recognise the disease previous to collapse; but here the defect lies in the surgeon, not in the regulations.[1]

The total saving of life during the sixteen years that removal has been practised has been 18,152, as shown in the table appended. The mortality among the European troops in eleven of the chief military stations was 14·90 per 1,000 previous to removal, and 6·69 per 1,000 subsequently.

In a financial point of view the lives of European and native soldiers and prisoners are not considered of equal value—the European soldier being estimated at £200—whilst the native

[1] In India the disease is present every year, and these regulations are in constant use. Dr. Cuningham, in his last Sanitary Report for 1878, states, p. 73:—"The medical officers are almost unanimous in the opinion that the evacuation of the affected buildings and movement into camp, when this more decided measure was required, was attended with the best result. In very many instances no further case occurred. With few exceptions it is said the change into camp did not induce other diseases; in some cases it is reported, on the contrary, to have had a beneficial effect."

prisoner is a negative value—but in a professional point of view all lives are equal.

The diminished mortality is considered by some as the result of sanitary measures, which have been in progress since 1848. The benefit of these is indicated in the table by a diminution of 16·69 admissions and 3·80 deaths per 1,000 in the period from 1848 to 1863, as compared with the previous division of time. But the diminution from 1863 to 1878 shows an improvement of 12·75 admissions and 3·00 deaths per 1,000 on that period. The more perfect sanitary measures doubtless contributed to this, but the mortality in some of the individual stations proves that something more than defective sanitation is required to cause the great mortality from cholera; the virulence of the disease appears unchanged, and it is by escaping from the attack by removal that life is saved.

It seems to me strange that regulations of a similar character have not been introduced by any of the governments of Europe for the benefit of their armies. The disease is not so prevalent as in India; but there have been severe epidemics since 1831, and their return should be anticipated. If such measures were clearly understood and ably enforced, panic would be averted, which is the ordinary effect of the appearance of an epidemic.

ADMISSIONS AND DEATHS FROM CHOLERA AMONG THE EUROPEAN AND NATIVE TROOPS AND NATIVE PRISONERS FROM 1817 TO 1878.

From the *Records of the Medical Board.*

Date.	No. Years	Strength.	Admission.	Deaths.	Ratio per 1000: Admission.	Ratio per 1000: Deaths.	Deaths, Admissions	Saving: Admission	Saving: Deaths
European Troops—Bengal Upper Provinces, Madras and Bombay.									
1817 to 1832	16	431,014	16,975	4,130	39 38	9 59	24 33		
1833 to 1847	15	464,939	13,066	5,082	30 23	10 43	38 88		
1848 to 1862	15	783,834	14,199	5,252	18 11	6 46	36 99		
1863 to 1874	16	917,833	4,921	3,177	5·36	3 46	64 56		
Total . .	62	2,597,020	49,161	17,688	18 88	6·79	35·88		
1817 to 1862	46	1,679,787	44,240	14,464	26 34	8 67	32·43		
1863 to 1878	16	917,833	4,921	3,177	5 36	3 46	64·56	19,164	4,791
Native Troops—Bengal Upper Provinces, Madras and Bombay.									
1817 to 1832	16	2,294,709	32,387	9,479	14·11	4 13	29 26		
1833 to 1847	15	2,845,626	25,279	10,089	8 90	3·54	39 91		
1848 to 1862	15	2,639,024	14,039	5,745	5·37	2 11	40 92		
1863 to 1878	16	1,599,512	5,997	3,143	3 75	1·96	52 41		
Total . .	62	9,378,771	77,702	28,456	8·28	3 03	36 62		
1817 to 1862	46	7,779,359	71,705	25,313	9 23	3 25	35 30		
1863 to 1878	16	1,599,512	5,997	3,142	3·75	1·96	52·41	8,765	2,127
Native Prisoners—Bengal Upper Provinces, Madras and Bombay.									
1833 to 1847	15	564,184	21,948	9,288	30 90	16 46	42·32		
1848 to 1862	15	818,770	23,408	10,208	28 71	12 47	43·61		
1863 to 1878	16	1,315,548	16,812	7,356	12 77	5·59	43·76		
Total . .	46	2,768,502	62,168	26,852	22 45	9·70	43 69		
1833 to 1862	30	1,382,954	45 356	19,496	33·59	14·10	85·20		
1863 to 1878	16	1,315,548	16,812	7,356	12·77	5·59	43 76	27,389	11,284
			Total					55,318	18,152
Total European and Native Troops and Native Prisoners in India from 1817 to 1878.									
1817 to 1862	138	10,842,100	161,301	59,273	14·88	5 47	36 76		
1863 to 1878	48	3,832,893	27,730	13,676	7 23	3·57	49 32	28,960	7,283
Total . .	186	14,674,993	189,031	72,949	12 88	4 97	38 59		
Deaths and Admissions from Cholera among the European Troops in 11 of the principal Stations in the Bengal Presidency from 1817 to 1878.									
1817 to 1832	16	174,975	6,035	1,909	34 49	10·91	31·46		
1833 to 1847	15	172,158	6,470	2,357	37 58	13 63	36 42		
1848 to 1862	15	280,721	9,519	5,024	33 55	17 90	52 83		
1863 to 1878	16	255,804	2,541	1,705	9 93	6 69	67 10		
Total . .	62	883,658	24,565	10,995	27 91	12·44	44·76		
1817 to 1862	46	627,854	22,024	9,290	35 05	14·80	42·18		
1863 to 1878	16	255,804	2,541	1,705	9·93	6 69	67·10	6,425	2,074

THE REPORT OF THE IMPERIAL GERMAN MEDICAL COMMISSION ON THE PLAGUE WHICH PREVAILED IN THE PROVINCE OF ASTRAKHAN DURING THE WINTER OF 1878 AND 1879.[1]

BY J. LAWRENCE-HAMILTON, L.R.C.P., ED., &c.

In the following paper I have endeavoured to give a brief, but accurate, summary of the official report of the Imperial German Medical Commission on the outbreak of plague in the province of Astrakhan during the winter of 1878-79.

In January 1879 news reached Berlin of the appearance of plague in Russian Astrakhan. As both the official reports and information derived from the newspapers on the subject were vague and unsatisfactory, the German Government, acting in harmony with the Governments of Austro-Hungary and Roumania, and with the official sanction of Russia, sent out a medical commission of inquiry to Astrakhan. Germany was represented by Dr. August Hirsch, Dr. Küssner, and Dr. Sommerbrodt; and these gentlemen, accompanied by a professed linguist, Mr. Rössler, arrived in Astrakhan towards the close of February 1879. The Commission write in high praise of the courteous and attentive assistance rendered to them by Count Loris Melikof, the then Russian Governor-General, specially appointed, with extraordinary powers, in view of the plague in the province of Astrakhan. The report, written by Dr. August Hirsch and Dr. Sommerbrodt, recognises the assistance derived in the inquiry, from the Austro-Hungarian Commissioners, Professor Biesiadetzky and Dr. Kiemann; the Russian Commissioner, Dr. Eichwald; and the French Commissioner, Professor Zuber.[2]

[1] A paper read before the Epidemiological Society.

[2] It may be mentioned that the English Medical Commission did not get to Astrakhan till some three weeks after the German. The British Government selected Surgeon-Major Colville of the British Residency, Bagdad, and Dr. J. F. Payne, of St. Thomas's Hospital, as commissioners. The Swedish commissioners

Astrakhan is a province of Russia, bordering the Caspian. Sea to the north-west, and traversed by the rivers Volga and Ural in the latter part of their course. The right bank of the Volga is some thirty meters or more above the sea's level, whereas the left side is but little above it, and is liable to frequent overflows from the river during floods. The rich salt marshes of Astrakhan are well known. The province is chiefly a vast steppe or huge extended plain, and almost destitute of trees. The summer dryness is intense, as here heavy rainfalls are most rare and exceptional. With the closing autumn and with the commencing spring frightful snowstorms rage, when, owing to the dryness of the soil, such immense masses of dust are apt to be whirled or raised up, as even to occasionally produce a change in the physical appearance of the surface, and indeed quite to choke up with sand an entire neighbourhood. The climate is very hot, often tropical in summer, whilst the cold in winter is very severe. Towards the latter half of November real winter sets in, the rivers become frozen over, whilst the temperature is often some ten degrees Reaumur below the freezing point of water.

The domiciled population of Astrakhan is given at 500,000, whilst 150,000 of the tribes are still nomadic in their habits.

The accumulated observations of twelve years record one birth for every 36·5 persons, whilst one death takes place for every twenty-one of the inhabitants of Astrakhan; or in other words, this population would gradually become extinct were it not being continually recruited from external sources. Grain is only capable of cultivation in very circumscribed localities. Mustard is abundant and remunerative. The Tartar tribes give attention to gardening. The number of oxen, horses, and camels in Astrakhan is estimated from 2 to 2⅓ millions, of which upwards of 40,000 are employed as transport animals within the province. The principal occupation of Astrakhan province is fishing, which alone demands the services of some 50,000 boatmen. Caviar,

were Drs. Duner and Malthe, whilst Denmark was represented by Dr. Feilberg. M. Lallemand was a further commissioner from France, whilst Dr. Jacoby was the second commissioner in rank selected by the Russian Government.

There was no joint or international commission, as the Russian and foreign commissioners decided to act independently, though some of them travelled together in company.—J. L.-H.

or the prepared roes of certain large fish salted, and the most celebrated in the world, is largely exported; also fish, isinglass, train-oil and blubber. The transport traffic from and to other provinces of Russia, for and from the Caspian Sea, Caucasia, and Asia, and along the River Volga, is extensive. In Astrakhan, for the carrying-trade by shipping on the Volga alone, some 6,000 hands are employed in connection with about seventy steamers and 800 sailing vessels.

There is a railway completed between Tzarizin and Griasi. The German Commission dwell deprecatingly on the absence of European consuls at Tzarizin, Persia alone possessing an official representative there.

In Astrakhan province most of the people seem well to do, but a fearful want of general cleanliness is here as strikingly characteristic as in other parts of Russia. In the city of Astrakhan most of the streets are devoid of pavement. There are no fresh-water springs, and the water supply is drawn from the fouled branches of the Volga.

The labourers employed in fish salting exist under miserable conditions. In many places they dwell in cavities hollowed in the earth, or in caverns. The price of bread being beyond their means they subsist chiefly on the leavings of the inferior parts of the prepared fish. Formerly government rules enforced that the unused remains of the prepared fish should be thrown directly into the water, but now these, collected and accumulated in masses, are left to rot in and about the banks of the rivers under the heat of sometimes an almost tropical sun. Further, the vats used for salting the fish are never properly or systematically cleaned. It is the custom merely to add more salt from time to time. The local atmosphere is further vitiated by many fat-boiling works.

The German Commission does not attribute the outbreak of the plague directly to these local conditions, as for many years this disease has not visited these localities. Owing to the general low-lying ground immediately bordering the Volga, malaria, rheumatic fever, inflammatory diseases, chiefly of the respiratory system, are prevalent, though it has been specially noticed that phthisis seems almost unknown in the province.

Scrofula and syphilis are reported as being almost universally present.

During the five years preceding the outbreak of plague, enteric fever, measles, and small-pox had been epidemic, whilst scarlet fever raged in 1876 and 1877. During the previous four years the Commission heard only of the occurrence of one case of maculated typhus, but typhoid fever had been comparatively frequent.

The town of Astrakhan during the last twenty-two years has suffered nine epidemic attacks of cholera, and three of enteric fever. Previous to the last outbreak of plague, the epidemic had not been present in Astrakhan since the beginning of the century. An outbreak of the disease occurred commencing in August, 1807, and continuing to February, 1808. Comparatively few persons were then attacked, and the mortality was but small.

In 1878 and 1879 the pancity of doctors, army-surgeons, and medical assistants was lamentable, especially outside the city of Astrakhan. The recent epidemic showed them to be deficient in the art of diagnosis, as they long reported the plague as being "malignant typhus," "pneumonic croup," and so forth.

In Astrakhan province, plague made its first appearance probably during the first half of October, 1878; the earlier cases being mild in character and not ending fatally. The official Russian reports couple these first cases with malarial fever, whilst other reports state that plague was superadded to the already prevalent "bubonic malarial fever." We are not able to estimate the truth of either of these statements. It is, however, certain that plague arrived in Vetlianka when the local and native physicians had already spoken of epidemic, malignant, malarial fever, and of enteric fever.

In Vetlianka the plague began either towards the close of September or else early in October, 1878, whilst the epidemic spread generally about the end of November, 1878.

During the three terminal weeks of November, 1878,[1] the number of deaths from the plague in this district were 7,—8,—and 7 respectively. Whilst in the first week of December there were counted fifty-six victims, in the second week the maximum number of 169 was reached, and in the third week

[1] The dates throughout are given in Old Style.

the number fell to fifty-four. Hence the decline was rapid and the very last death occurred on the 12th (O.S.) of the following January, (1879). In Vetlianka 20 per cent. of the entire population was carried off, or 25·3 in the hundred were attacked with a mortality of 82 in the hundred seized.

The course of the epidemic was highly erratic, now here, now there. It seemed to be influenced and determined far more by personal communication among the families than by geographical or topical considerations.

The public in Astrakhan soon became alive to the presence in its very midst of the plague. Then all at once the community was seized with a panic. Family ties were broken asunder, and the natural loyalty of near blood and of old friendships severed. Upon the faintest suspicion of being stricken with the plague, the individual was forthwith thrust out of the community by his nearest relative, into the common pest-house. Beyond doubt many a one afflicted with other and trivial diseases, by being flung into the pest-house, caught the plague. All shunned the house where the plague had entered, and hence several little helpless children were left within to die of starvation.

Among other instances may be noticed that of a brave local priest who conscientiously nursed and tended the plague-stricken of his flock. He himself soon succumbed to the plague. No one could be induced to bury him. So his wife, though far advanced in pregnancy, aided by her sister, dug out his grave in the hard frozen ground. A few days afterwards both these women were dead from the plague.

A young woman, eighteen years of age, having complained of pains in the head, was thereupon immediately incarcerated in the pest-house, where drunken nurses could only be obtained. (Indeed the people believed that it was only safe to attend upon the sick, when the nurses were under the influence of brandy.) She soon fell ill with the prevailing epidemic. Upon recovering consciousness she discovered herself in a room with seven corpses, where the windows of the apartments were broken. It was now the depth of winter. To keep out the cold she was compelled to seize upon the clothes and bedding of the dead around her, yet both her feet suffered from frost-bite. Becoming

somewhat stronger, her continued shrieks brought her relief from her captivity through a man, a stranger, chancing to pass by.

The doctors and nurses becoming so very rapidly fatally ill, the extent of the panic increased.

Continuing along the course of the Volga, Prischib was next visited by the plague. On November the 30th (O.S.) 1878, from Prischib, one Irina Jefframowa, drove over to see her relations in Vetlianka, among whom was her soldier-brother, who had returned from the wars, and in whose house she resided. On December the 3rd she went back to her home in Prischib, where she was seized ill on the 5th, and died on the 11th of the month. Her household chanced to consist of nine persons, all of whom, save her mother, were dead by the 20th.

From Prischib, three sisters of mercy stayed in Vetlianka for only twenty-four hours, and were again home by the 8th of December. On the 12th they were attacked by the plague, which carried them off by the 16th. Six days later a female servant in attendance upon them next succumbed. These sisters of mercy had been attended to and buried by four nurses and carriers of the dead, who lived next door, and who also were seized ill, and all were dead by the 24th of December (1878).

In five houses in Prischib, between the 5th and the 24th of December, there occurred sixteen deaths including two children.

Through personal communication Vetlianka was evidently the infecting focus to several adjoining districts.

The Vetlianka outbreak commenced in the first half of October, 1878, and closed with the end of January, 1879, after having sacrificed 420 victims. Nine of the civil and military doctors stationed in and about Vetlianka died of the plague.

Dr. Rudkowski, who saw the last four cases which occurred in Staritzkoie, gives the following account of the case of a strong-built girl of nine years of age.

On *December 29th* the child was suddenly seized ill at three in the morning with cold shivers, headache, thirst—persistent even after taking cooling drinks—and constipation. At nine on that morning Dr. Rudkowski saw the child. She was still able to sit on a bench. Her face was pallid and puffy; the temperature above the normal; the respiration free; no rash present.

She complained of pain in the abdominal region and of severe headache, was very thirsty, and had no appetite.

2 p.m.—Dr. Rudkowski observed that her tongue was rather dry and coated with white fur. The pulse numbered 100, but was small. The constipation continuing, castor oil was administered.

7 a.m.—The girl's bowels had been opened. She now vomited after each attempt at drinking, and refused to take any further medicine. She complained of headache, and of oppression about the pit of the stomach. The tongue was white, the respiration still free, but the temperature increased.

December 30th, 9 a.m.—The patient had passed a bad night, and was suffering from thirst and a feeling of general anxious oppression. She vomited after taking physic. Her temperature was 37° Centigrade. No urine was saved. No further motions had been passed.

2 p.m.—The girl was throwing herself about violently, as she lay on the ground, chiefly on her belly, with her feet outstretched. She complained of violent pain and great oppression. The pulse was accelerated. No urine passed. Spasms had been observed in the hands and feet.

7 p.m.—Dr. Rudkowski found his little patient wandering and shrieking, whilst the nurse reported tetanic like spasm "with arching of the spine and extremities." Later in the night these attacks are stated to have occurred. On the 31st of December death took place, after an illness of forty-eight hours' duration. Dr. Rudkowski found the girl dead, lying on her abdomen with outstretched legs. No spots or swellings were observed after death.

In other fatal cases Dr. Rudkowski observed that the jaws were firmly set or closed, and the elbows bent. It is noted that his observations were neither taken down at the time nor at the bed-side, but given later from memory. Dr. Rudkowski thus describes the broad course and symptoms of the plague in the cases he saw:—It began with a sense of cold, headache, thirst, and in a few hours later with a dreadful feeling of peculiarly grave oppression, which Dr. Rudkowski considered as pathognomonic of plague. Consciousness remained save during the attacks of tetanic cramps. The patients were themselves fully

aware of approaching death. Dr. Rudkowski did not observe in any of his patients the presence of glandular swellings, nor any rash on their skin. Constipation was general. The urine was at first scanty and then suppressed. Dr. Rudkowski took the temperature thrice daily. It generally varied between 37° and 39° Centigrade ; in one case only did it amount to 40·5° Centigrade.

Dr. Rudkowski examined his patients with his hands previously anointed with carbolised oil. He disinfected his hair and beard with the carbolic acid spray. Post-mortems were not performed.

In Vetlianka several cases were reported in which buboes were found in the armpits, groins, and one instance in the right side of the neck. Where recovery took place, suppuration of the buboes occurred occasionally. The German Commission fully believe that the disease was the bubonic plague.

In Vetlianka, indeed, the epidemic was distinctly bubonic, with the comparatively small fatality of 50 per cent., whilst in Prischib and Starizkoie the disease was unattended with buboes. Possibly, at the commencement of the epidemic, in the intense fright and panic, the existence of buboes might have been overlooked. The German report lays stress upon the unity of the two forms of plague—that with buboes and that without buboes. For example :—

The family of Charitonow comprised three living generations, numbering thirty-two individuals, of whom, twenty-five being seized by the epidemic, thirteen died, nearly all of whom had buboes.

Ossip Bielow's household counted seventeen souls, all of whom succumbed to the plague. It is reported that not one of these had any buboes.

The Turkish Medical Commissioner, Dr. Kabiadis, who had observed the last plague epidemic in Mesopotamia, remarks that, in the agony of the plague, though small buboes may be now and then overlooked, in the most severe and rapid cases of plague there is no time for the development of the buboes.

(*To be continued.*)

THE DUTIES OF MEDICAL OFFICERS OF HEALTH AND INSPECTORS OF NUISANCES.

THE Local Government Board, under date the 8th March of the present year, issued a new series of General Orders relative to the appointment of Medical Officers of Health and Inspectors of Nuisances. The earlier Orders, issued in 1872, applied solely to such of these officers whose salaries were repaid in part out of moneys voted by Parliament. The present Orders include an Order defining the qualifications and duties of medical Officers of health whose salaries are paid entirely by the Sanitary Authorities appointing them, and as these are the same as those required by medical officers of health who are partly paid out of Imperial funds, the qualifications and duties will be made uniform throughout the kingdom. Similar uniformity cannot, however, it would appear, be secured in the case of inspectors of nuisances, the Local Government Board not having power to issue regulations regarding these officers unless their salaries are in part paid out of moneys voted by Parliament.

The duties of a medical officer of health have been amended in two or three respects in the new Orders; and the duties of the inspectors of nuisances, so far as the Orders relating to these officers apply, have also been amended, as far as necessary, in correspondence with changes in the medical officer of health's duties. We reprint for the information of our readers the portion of the Orders relating to "duties" as they now stand. We may add that a medical officer of health is required to be a registered medical practitioner, and qualified to practise in both medicine and surgery. The Local Government Board may if it see fit, upon the application of a Sanitary Authority, dispense with so much of the regulation as requires a candidate to be qualified both in medicine and surgery. As regards the medical officer of health, we quote the duties as set forth in relation to those officers who are paid wholly by the Sanitary Authorities appointing them. The differences in phraseology in the "duties" as stated in the several Orders relate to legal differences in the relation of the officers to the Local Government Board.

Duties of a Medical Officer of Health as Ordered by the Local Government Board, March, 1880.

The following shall be the duties of the Medical Officer of Health in respect of the District for which he is appointed :—

(1) He shall, within seven days after his appointment, report the same in writing to the Local Government Board.

(2) He shall inform himself as far as practicable respecting all influences affecting or threatening to affect injuriously the public health within the District.

(3) He shall inquire into and ascertain by such means as are at his disposal the causes, origin, and distribution of diseases within the District, and ascertain to what extent the same have depended on conditions capable of removal or mitigation.

(4) He shall by inspection of the District, both systematically at certain periods, and at intervals as occasion may require, keep himself informed of the conditions injurious to health existing therein.

(5) He shall be prepared to advise the Sanitary Authority on all matters affecting the health of the District, and on all sanitary points involved in the action of the Sanitary Authority, and in cases requiring it, he shall certify, for the guidance of the Sanitary Authority or of the Justices, as to any matter in respect of which the Certificate of a Medical Officer of Health or a Medical Practitioner is required as the basis or in aid of sanitary action.

(6) He shall advise the Sanitary Authority on any question relating to health involved in the framing and subsequent working of such bye-laws and regulations as they may have power to make.

(7) On receiving information of the outbreak of any contagious, infectious, or epidemic disease of a dangerous character within the District, he shall visit the spot without delay and inquire into the causes and circumstances of such outbreak, and in case he is not satisfied that all due precautions are being taken, he shall advise the persons competent to act as to the measures which may appear to him to be required to prevent the extension of the disease, and so far as he may be lawfully authorised, assist in the execution of the same.

(8) Subject to the instructions of the Sanitary Authority, he shall direct or superintend the work of the Inspector of Nuisances in the way and to the extent that the Sanitary Authority shall approve, and on receiving information from the Inspector of Nuisances that his intervention is required in consequence of the existence of any nuisance injurious to health, or of any overcrowding in a house, he shall, as early as practicable, take such steps authorised by the Public Health Act, 1875, in that behalf, as the circumstances of the case may justify and require.

(9) In any case in which it may appear to him to be necessary or advisable, or in which he shall be so directed by the Sanitary Authority, he shall himself inspect and examine any animal, carcase, meat, poultry, game, flesh, fish, fruit, vegetables, corn, bread, flour, or milk exposed for sale, or deposited for the purpose of sale or of preparation for sale, and intended for the food of man, which is deemed to be diseased, or unsound, or unwholesome, or unfit for the food or man; and if he finds that such animal or article is diseased, or unsound, or unwholesome, or unfit for the food of man, he shall give such directions as may be necessary for causing the same to be seized, taken and carried away, in order to

be dealt with by a Justice according to the provisions of the Statutes applicable to the case.

(10) He shall perform all the duties imposed upon him by any bye-laws and regulations of the Sanitary Authority, duly confirmed, in respect of any matter affecting the public health, and touching which they are authorised to frame bye-laws and regulations.

(11) He shall inquire into any offensive process of trade carried on within the District, and report on the appropriate means for the prevention of any nuisance or injury to health therefrom.

(12) He shall attend at the office of the Sanitary Authority, or at some other appointed place, at such stated times as they may direct.

(13) He shall from time to time report in writing to the Sanitary Authority, his proceedings, and the measures which may require to be adopted for the improvement or protection of the public health in the District. He shall in like manner report with respect to the sickness and mortality within the District, so far as he has been able to ascertain the same.

(14) He shall keep a book or books, to be provided by the Sanitary Authority, in which he shall make an entry of his visits, and notes of his observations and instructions thereon, and also the date and nature of applications made to him, the date and result of the action taken thereon and of any action taken on previous reports; and shall produce such book or books, whenever required, to the Sanitary Authority.

(15) He shall also prepare an annual report, to be made to the end of December in each year, comprising a summary of the action taken during the year for preventing the spread of disease, and an account of the sanitary state of his District generally at the end of the year. The report shall also contain an account of the inquiries which he has made as to conditions injurious to health existing in his District, and of the proceedings in which he has taken part or advised under the Public Health Act, 1875, so far as such proceedings relate to those conditions; and also an account of the supervision exercised by him, or on his advice, for sanitary purposes over places and houses that the Sanitary Authority have power to regulate, with the nature and results of any proceedings which may have been so required and taken in respect of the same during the year. It shall also record the action taken by him, or on his advice, during the year, in regard to offensive trades, and to factories and workshops. The report shall also contain tabular statements (on forms to be supplied by the Local Government Board, or to the like effect), of the sickness and mortality within the District, classified according to diseases, ages, and localities.

(16) He shall give immediate information to the Local Government Board of any outbreak of dangerous epidemic disease within the District, and shall transmit to the Board a copy of each annual and of any special report.

(17) In matters not specifically provided for in this Order, he shall observe and execute the instructions of the Local Government Board on the duties of Medical Officers of Health, and all the lawful orders and directions of the Sanitary Authority applicable to his office.

(18) Whenever the Local Government Board shall make regulations for all or any of the purposes specified in Section 134 of The Public Health Act, 1875, and shall declare the regulations so made to be in force within any area comprising the whole or any part of the District, he shall observe such regulations so far as the same relate to or concern his office.

Duties of an Inspector of Nuisances as Ordered by the Local Government Board, March 1880.

The following shall be the duties of the Inspector of Nuisances in respect of the District for which he is appointed :—

(1) He shall perform, either under the special directions of the Sanitary Authority, or (so far as authorised by the Sanitary Authority) under the directions of the Medical Officer of Health, or in cases where no such directions are required, without such directions, all the duties specially imposed upon an Inspector of Nuisances by The Public Health Act, 1875, or by the Orders of the Local Government Board, so far as the same apply to his office.

(2) He shall attend all meetings of the Sanitary Authority when so required.

(3) He shall by inspection of the District, both systematically at certain periods, and at intervals as occasion may require, keep himself informed in respect of the nuisances existing therein that require abatement under The Public Health Act, 1875.

(4) On receiving notice of the existence of any nuisance within the District, or of the breach of any bye-laws or regulations made by the Sanitary Authority for the suppression of nuisances, he shall, as early as practicable, visit the spot, and inquire into such alleged nuisance or breach of bye-laws or regulations.

(5) He shall report to the Sanitary Authority any noxious or offensive businesses, trades, or manufactories established within the District, and the breach or non-observance of any bye-laws or regulations made in respect of the same.

(6) He shall report to the Sanitary Authority any damage done to any works of water supply, or other works belonging to them, and also any case of wilful or negligent waste of water supplied by them, or any fouling by gas, filth, or otherwise, of water used for domestic purposes.

(7) He shall from time to time, and forthwith upon complaint, visit and inspect the shops and places kept or used for the sale of butcher's meat, poultry, fish, fruit, vegetables, corn, bread, flour, or milk, or as a slaughter-house, and examine any animal, carcase, meat, poultry, game, flesh, fish, fruit, vegetables, corn, bread, flour, or milk which may be therein; and in case any such article appear to him to be intended for the food of man, and to be unfit for such food, he shall cause the same to be seized, and take such other proceedings as may be necessary in order to have the same dealt with by a Justice: provided that in any case of doubt arising under this clause he shall report the matter to the Medical Officer of Health, with the view of obtaining his advice thereon.

(8) He shall, when and as directed by the Sanitary Authority, procure and submit samples of food, drink, or drugs suspected to be adulterated, to be analysed by the analyst appointed under "The Sale of Food and Drugs Act, 1875," and upon receiving a certificate stating that the articles of food, drink, or drugs are adulterated, cause a complaint to be made, and take the other proceedings prescribed by that Act.

(9) He shall give immediate notice to the Medical Officer of Health of the occurrence within the District of any contagious, infectious, or epidemic disease: and whenever it appears to him that the intervention of such Officer is necessary

in consequence of the existence of any nuisance injurious to health, or of any overcrowding in a house, he shall forthwith inform the Medical Officer thereof.

(10) He shall, subject to the directions of the Sanitary Authority, attend to the instructions of the Medical Officer of Health with respect to any measures which can be lawfully taken by an Inspector of Nuisances under the Public Health Act, 1875, for preventing the spread of any contagious, infectious, or epidemic disease of a dangerous character.

(11) He shall enter from day to day, in a book to be provided by the Sanitary Authority, particulars of his inspections and of the action taken by him in the execution of his duties. He shall also keep a book or books, to be provided by the Sanitary Authority, so arranged as to form, as far as possible, a continuous record of the sanitary condition of each of the premises in respect of which any action has been taken under the Public Health Act, 1875, and shall keep any other systematic records that the Sanitary Authority may require.

(12) He shall at all reasonable times, when applied to by the Medical Officer of Health, produce to him his books, or any of them, and render to him such information as he may be able to furnish with respect to any matter to which the duties of Inspector of Nuisances relate.

(13) He shall, if directed by the Sanitary Authority to do so, superintend and see to the due execution of all works which may be undertaken under their direction for the suppression or removal of nuisances within the District.

(14) In matters not specifically provided for in this Order, he shall observe and execute all the lawful orders and directions of the Sanitary Authority, and the Orders of the Local Government Board which may be hereafter issued, applicable to his office.

THE PRACTITIONER.

SEPTEMBER, 1880.

Original Communications.

A SUMMER IN ITALY.

BY DAVID YOUNG, M.D., FLORENCE.

II.

We left Florence on the 6th of July last, where the thermometer stood at 88° in the coolest room of our house, *en route* for Abetone; but instead of the usual road *viâ* Pracchia and San Marcello we took rail to Lucca and thence drove to the Bagni di Lucca, a distance of about twelve miles. The road is in some parts very beautiful, and follows the north bank of the Serchio till within a short distance of the baths, when it enters the beautiful valley of the lower Lima. The day was very hot, and we gladly welcomed a heavy shower which poured down just as we crossed the Ponte à Serraglio. The Bagni di Lucca may be said to consist of three distinct portions. The lower is at the bridge just named, and is usually called the *Ponte*, while about three-quarters of a mile higher up the valley is the so-called *Villa*. Immediately behind the *Ponte* and perched on the top of the cliff is the Bagni Caldi. Good accommodation can be had at the latter place, and the rather steep climb up is repaid by a fresher air and cooler nights.

Between the *Ponte* and the *Villa* is a beautifully shaded carriage drive, which is very inviting during the hot hours of the day. The Bagni looked bright and cheerful on this calm summer eve, and it will be long ere we forget the comfort we experienced at the *Hôtel d'Amérique* now under the excellent management of the younger Signor Pagnini. Early next morning we started for Abetone. Our way led through the *Villa*, which we reached by the shady carriage road which connects the *Ponte* and the *Villa*. Soon after leaving the *Villa* we recrossed the Lima and cantered along briskly through the chestnut-woods. Everything looked fresh and green from the previous night's rain, and being a bright summer Italian morning we wished that many of our friends had been with us to enjoy the delicious breeze and the lovely scenery.

Having made this digression, we now resume our narrative of the summer resorts in the Pistoia mountains.

The conclusion of our last letter found us on our way to the picturesquely situated village of Gavinana—a spot ever memorable in the history of these mountains as being the scene of the famous battle between Pope Clement VII., Carlo V. and the Florentines, in consequence of the attempt of the former to bring back the Medici to Florence. In this battle the illustrious Francesco Ferrucci fell on the 3rd August, 1530. Leaving the main Pistoia-Modenese road at Oppio, the traveller ascends by a rugged and recently-made road, which at first leads through patches of cultivated ground, but soon enters the chestnut forest. The trees in this forest are very old, and many of them have a peculiarly gnarled and fantastic appearance. Nothing is seen of the village, which nestles among the rich green foliage, until the traveller is close upon it. We drove into it on a bright pleasant day in the end of June, and confess that we had great sinking of heart and experienced keen disappointment at the squalid look which at a close view the village presented. We had caught a glimpse of it from the main road two years before, and thought that nothing could exceed the loveliness and picturesqueness of its position, and so were unprepared for such a sudden chilling of our expectations from it. However, as we had come for the purpose of finding out whether it was ever likely to become a summer

resort, we did not forget the object of our visit in the first impulse of our disappointment; so after partaking of a hearty luncheon at Miss Laing's *pension,* we sallied forth on our search, to become more intimately acquainted with the village and its surroundings. With regard to the houses themselves it is remarkable how carefully their builders contrived them so as to exclude the magnificent scenery by which they are surrounded. This to my mind is quite as wonderful as many of the "sights" which the traveller is invited to see, and in no way lessens the force of the local proverb which says, "When you have seen a church, a fountain, and a battlefield, you have seen Gavinana." We visited a good many of the houses, which were as usual dark and stuffy, every window being tightly closed as if the entrance of the sun and air of heaven would bring a pestilence with them. Throwing these open one after another, we searched in vain for a peep of the verdant hills around. In more than three-fourths of the houses we thus visited the outlook from the windows gave one no idea that they were in the midst of the fine scenery of the Apennines. Leaving the village, we turned our steps towards the grand old forest, and were particularly charmed with the fine park which lies between the houses and the mountains: everywhere a carpet of the richest green met the eye, with here and there scattered up and down its lovely glades clumps of fine old trees which afforded much more efficient shade than is usually found in chestnut woods. Gavinana is situated on an eminence on the southern slope of the Apennines under Monte Crocicchio, and is about 2,500 feet above the level of the sea. It may be described as a small mountain village town in which several good houses could be found suitable for summer quarters. It has a supply of excellent water, the air is moderately dry and unstimulating, and from its proximity to the chestnut-forest affording in some degree excellent shade. It has therefore many elements which, if developed, are capable of making it a pleasant summer residence. There is one very good hotel belonging to the brothers Orsatti, and an excellent *pension* kept by an Edinburgh lady—Miss Laing.

From Gavinana, San Marcello is reached by a rough but good walking road. This is a favourite walk with the visitors at

Gavinana: the distance between the two places is little more than a mile and a half.

San Marcello is about 2,100 feet above sea-level, and until quite recently has been the most frequented spot in summer among the Pistoia Apennines, chiefly because it is easy of access, being situated on the main road, and in possessing advantages which the other places had not, in the shape of comfortable houses, hotels, post and telegraph offices, &c. It is however inferior in point of climate to either Gavinana or Cutigliano, being several hundred feet lower than both these places, and, what is of more consequence, much worse off in respect of shade. During the summer months the place is completely enveloped in dust, and there is no shade worthy of the name within a considerable distance of the town. The absence of shade is perhaps the greatest defect of San Marcello as a summer quarter. There is also a heavy dewfall. However, the air is pure and the nights delightfully cool, but the visitor would be compelled to spend the greater part of the day within doors. It is indeed impossible to be much in the open air except in the evening or early morning, and invalids and others who expect to find shady and pleasant walks in the woods would be greatly disappointed in San Marcello—and to some extent, although to a less degree, the same remark is applicable to Gavinana and Cutigliano. To those, however, who would be content to spend their day indoors and enjoy a pleasantly cool morning or evening stroll, San Marcello has several advantages. There is at least one well-kept hotel and one good café, about which there is always more or less life during the summer evenings. Being moreover a good-sized village town there is not the same isolation felt which some might complain of in higher mountain places. About midway between Gavinana and San Marcello Madame Picciolli of Florence has opened a summer *pension*. The house is very large and commodious, and situated in its own grounds at some distance from the main road and close to a chestnut wood. Two small mountain streams which pass near the house are to be utilised for a bathing establishment. The position I consider superior to San Marcello, but not quite equal to Gavinana. However, what the *pension* may lack in position it has more than made up for

by the internal arrangements. The house is replete with every comfort, and the grounds around it begin already to have a very home-like appearance. Beautiful flower-beds surround the building, and a well-kept prato (lawn) stretches away towards the wood, while here and there small rustic bridges are thrown across the streams which give the place the air of a comfortable residence.

Cutigliano is about six miles higher up the valley than San Marcello. It is, according to Professor Tigri, about 2,200 feet above the level of the sea, and has a commanding position at a considerable elevation above the Lima and on the right bank of that stream. It is fully a mile from the main road. The Lima is crossed by a substantial bridge, and then a very steep but well made zigzag road leads up to the little town. During the past few years Cutigliano has been an important summer place, and now numbers amongst its other advantages a club, café, post and telegraph offices. The situation of the town is very fine. It stands boldly out on the steep hill-side which forms the north bank of the Lima, and commands a magnificent view of the far-reaching chestnut forests which fill the valley of the Lima. Beyond these forests the first glimpse of the mountains around Abetone is obtained—the two peaks of the Libro Aperto (open book) conspicuously occupying the foreground, while the splendid valley of the Sestaione is seen extending far away towards the higher peak of the Tre Potenze. Cutigliano being on the very edge, or rather encircled by the chestnut forests, has much more to offer in the way of rambles through the woods than San Marcello, but even here it is necessary to spend a considerable portion of the day—say from about ten till three or four o'clock in the afternoon—in the house, especially on the part of those who are unable to make excursions among the higher mountains and to bear the heat of the sun and the fatigue which they entail. Little bits of shade may be found here and there in the woods, but anything like open-air life, such as sitting out or leisurely strolling in the woods, is not possible. There are portions of the forests, where the trees are older and larger, where invalids and others might be able to take their camp-stools and spend several hours a day enjoying the delightful fresh air among the trees, but these spots

are not numerous, and as far as I have been able to ascertain, are too far away to be easily reached. Nothing is more beautiful in a landscape than a chestnut forest, the rich green foliage affording great relief from the intense glare of the sun, but nothing can be more disappointing than the small degree of shade which it affords. I have searched in vain again and again for a place in these woods where, for example, one could send little children with their nurse, such as is so easily found in some parts of Switzerland: the shade afforded by chestnut woods as a rule is what may be aptly called "speckled shade," necessitating one to change his position every few minutes. Nor should this be a matter of surprise. These forests are intended to supply food for thousands of persons, and the trees are distributed in such a manner as not merely to allow a free circulation of air but abundance of sunshine as well in order to the ripening of the fruit. To those, however, who are capable of making excursions among the mountains, Cutigliano has many advantages. It is the centre and starting-point of many of the finest excursions in the neighbourhood, and this alone will always make it an attractive summer place. There is one fair hotel and three good *pensions*, two of them being English. Madame Rochat is well known to visitors to Florence, and Mrs. Jennings, who has just removed to her new house—La Ville—offers every comfort to English travellers.

Just above Cutigliano, but on the Abetone road, and close to the Ponte Sestaione, a very good hotel has been recently opened by the proprietor of the Hotel Milano in Florence: two miles higher up is Piano Sinatico, with its rather comfortless inn, and a mile beyond is Piano Cici, which some day may become a pleasant summer quarter. Still further on, towards Abetone is Cechetto, situated at the lower edge of the pine forests, where a comfortable *pension* has been opened by Madame Girard of Florence.

THE ABETONE.—This delightful retreat presents a striking contrast to the places which have been already briefly described, and in fact so great is the contrast that they cannot well be compared together. The great desideratum at Gavinana, San Marcello, and Cutigliano was *shade* in addition to a sufficiently cool atmosphere. At Abetone *shade* can be had in perfection

and in abundance. Indeed the *life* at Abetone is very much what it would be among the highest altitudes in Switzerland or in the north of Scotland. The flora of the valleys and sub-alpine regions is almost identical with that of the north of Scotland, and the temperature during the whole of last summer, from the 1st of July till the end of September, was that of an ordinary English summer. During my stay of nearly three months I made careful observations of the climate, the results of which, together with those of the present summer, made with better instruments, I hope to fix in my next paper.

Abetone has two names—Boscolungo and Abetone; the former given in reference to the extent of the pine forests, and the latter from the fact of an immense silver fir having been felled during the construction of the road from Modena to Pistoia. The Italian name for a pine-tree is *Abete,* and for a great pine-tree *Abetone.*

The forests are composed almost entirely of pines, of which there are several varieties. The spruce and the silver fir are the most abundant; next comes the larch; and lastly, here and there in the depth of the forest are to be found solitary specimens of the hardy Scotch fir.

Leaving San Marcello, the road rapidly descends till it reaches the turbulent Lima, which at this spot is crossed by means of an ancient *turreted* bridge. Immediately after crossing this bridge the road divides—the one to the right going to Abetone, the other to the left to the Bagni di Lucca. From this point to the Bagni di Lucca is about ten miles, the road passing through some of the finest scenery of the lower Lima. Taking the right-hand road we at once turn towards Abetone. An easy ascent soon brings us in sight of Cutigliano, looking from her commanding position like the queen of the valley. Shortly after passing Cutigliano the massive Ponte Sestaione is crossed and the real ascent to Abetone begins. The road now winds through the great chestnut forest. Slowly climbing up, first leading to the right, then towards the left, and again turning back upon itself, till by a series of the most picturesque windings the chestnut forest is cleared and the zone of beech is reached a little way above Piano Cici. This magnificent mountain road, built in some places of splendid masonry, and

enlivened at several of its most beautiful *turns* by quaint-looking little hamlets, is a standing memorial of the splendid engineering abilities of the famous monk, Leonardo Ximenes. The upper valley of the Lima is much wilder than the lower, and the stream pours over its rocky bed in a ravine of immense depth. The road climbs along the south side of this gorge, and the traveller is reminded that he has left the chestnut forest behind, not only by the presence of beech-trees everywhere around him, but by the freshness and strength of the air. Invariably at this part of the road he quits his carriage and pushes on ahead enjoying the delicious cool breeze, after the stifling heat which he had experienced only a couple of miles below. For nearly three miles nothing is seen but beech on the mountain-sides, till at length just below Cechetto a small belt of larch is reached, on the right side of the road At this point the long line of forests first becomes visible, and away in the distance rising up between the traveller and the western sky is a conspicuous wooded hill crowned with stately beeches of great age. This hill marks the summit of the *pass*, which is now scarcely three miles off. The road here is comparatively level, and for some distance skirts the edge of the great forest which forms one of the watersheds of the finest of all the streams of the higher Apennines—the Sestaione. Far down in the depths away towards the right the Lima, here little more than a tiny rill, speeds its way along its almost unseen bed, while rising up on the steep hill-sides beyond the picturesquely situated little hamlets of Rivoreta Melo and Bicchiere are seen. Higher up, the valley becomes narrower, and the magnificent spruce and silver pines line the road on both sides. About half a mile from the summit there is a break in the forest, and between the road and one of the sources of the Lima lies the nursery ground of the Forest Department, while almost opposite is the handsome residence of the officer in charge of the forests and the recently built Albergo della Lima. Immediately adjoining the nursery ground is a beautiful and extensive undulating park—the general rendezvous of those of the visitors who limit their excursion to the neighbourhood of the hotel. On the upper edge of this park the Hotel Orsatti is situated, commanding a most lovely view of the valley below, of the Cappel d'Orlando, and away beyond, of the Apennine range

towards the Corno alle Scale and the Lago Scaffaiolo. Beside the hotel are the parish church and the post-office. Just above the church is another park commanding a still more splendid view than the one below, and which is the spot of all others likely to become ere long the site of an important summer sanatorium. After passing the upper park the road again enters the forest at one of its most beautiful turns, and a walk of three minutes brings the traveller to the summit of the pass—which is the frontier of the two old duchies of Tuscany and Modena.

Emerging from the deep shade of the lovely forest-road, the traveller sees before him two simple but picturesque stone pyramids which mark the boundary between the two provinces; but he is unprepared for the splendid panorama which bursts upon his view the moment his feet touch the boundary line. Suddenly he finds himself at the head of a magnificent valley which stretches away before him as far as the eye can reach. The valley is bounded on the left by the forests and alps of Faidelo, and on the right by the Appenine chain, with Cimone lifting its hoary head against the bluest of blue skies.

Immediately in front Monte Modino a bold rugged mountain ridge abruptly crosses and partly breaks up the valley; and away beyond it, rising up range after range, the vast mountain chains of the Neggio and Modena alps are distinctly seen. At the head of the valley and close to the pyramids and in full view of this glorious panorama, stands the *pension* of Senabassa, kept by Dr. Major.

ERGOT IN DIABETES MELLITUS.

BY JOSEPH W. HUNT, M.D. (LONDON),

Physician to the Wolverhampton and Staffordshire General Hospital.

TILL but a few days back I fondly imagined that I should be the first to recommend to the profession the use of ergot as a more or less successful mode of treating certain forms of diabetes. I have however lately found that Dr. Pepper of Philadelphia advocates its use,[1] though he does this more for the relief of a symptom, profuse diuresis, than as the main feature in the treatment of the disease. It is very possible too that others may have reported cases treated by the same drug, though these have escaped my notice; while undoubtedly many must have tried it, even if they have not reported their results, since its great value in diabetes insipidus and its well-known action in causing a contraction of the arterio-capillary vessels must have led to its adoption by those who consider diabetes to depend primarily on some disorder of the vaso-motor system.

Thos. A., æt. 40, married, an engine fitter, was admitted as an in-patient under my care, March 27, 1880. With the exception of sixteen weeks illness, said to be "consumption," when he was fourteen years old, he had enjoyed good health till the last few years. Lately he had suffered from chronic bronchitis, which he attributed to his working in a steam shed. A paternal aunt died of phthisis, and his eldest daughter suffers from severe epileptic fits. No other phthisical or neurotic history could be obtained. He had always been a moderate drinker, but last Christmas Eve he drank much more than his wont, especially of spirits, and was "quite drunk." On the following day there was a sudden onset of marked thirst, accompanied by profuse diuresis. These symptoms increased, and he very rapidly lost

[1] *New York Medical Record*, July 10, 1880.

weight. He was seen by an experienced medical man, who recognised the nature and gravity of the case, and by whom he was placed on a most judiciously selected diet, notwithstanding which he continued, though more slowly, to retrograde, passing, according to his own account, about three quarts of water in the twenty-four hours, and drinking much the same amount of fluids.

On admission he appeared to be a well-built man, with evident marks of having emaciated considerably. His expression was anxious. Skin slightly moist, non-febrile. No general or local œdema. No enlarged glands. Gums spongy, and bled readily; teeth loose, and breath offensive. Appetite good. Thirst very marked. Tongue broad, pale, moist, indented with teeth, and covered with whitish fur. Bowels constipated. An examination of the chest showed a marked tendency to emphysema, while at each apex, especially the right, the percussion note was slightly deficient. At each apex the breath sounds were divided and harsh, with prolonged expiration, and at the right apex was heard an occasional sonorous *rale*, most marked with expiration. The heart was normal. Pulse 80, small and compressible. Abdomen normal. Optic discs normal. Sight good. The urine was of a clear amber colour, acid, sp. gr. 1046. It contained a very large amount of sugar, and no albumen. He passed in the first twenty-four hours 76 ounces of water, but this, he said, was much below the normal amount. Weight 9 stone 13 lbs.

March 29th.—I saw him on my usual round and ordered him, Ext. Ergotæ Liquid. ʒj ter; and in order that this treatment might have a fair trial and be uncomplicated with other favourable conditions, I ordered him a full and liberal diet with plenty of starchy food. No sugar was allowed, but he was told he might have what else he liked, and having been for some time on a restricted diet, he gladly availed himself of the permission.

April 2nd.—Passed 60 ounces of urine, sp. gr. 1042. Ergot increased to ʒiss.

April 8th.—Passed 42 ounces, sp. gr. 1035. His general condition had much improved. All thirst had gone, and he told me with much pleasure that he had been ten hours without anything to drink. Though he got up twice at night to pass water, he

was able to hold it much longer. Weight, 10 stone. He was now strictly dieted, being ordered 4 ounces of cooked meat three times a day, 2 pints of ordinary beef-tea, 1 pint of milk, 1 lb. of green vegetables, and some gluten bread, to take nothing else.

April 14th.—Patient continued to improve, though he occasionally suffered severely from dyspepsia. His diet was reduced to a chop for lunch, and 2 ounces of meat twice a day with ½ lb. of vegetables; the liquids as before. As he very much disliked the gluten bread it was omitted, and he was allowed in its place about 2 ounces of very well-toasted thin slices of bread. Urine 38 ounces, sp. gr. 1026. For the last two weeks he had taken a considerable amount of walking exercise, and also assisted in more laborious employment, such as rolling the tennis lawn, but it always seemed to me as if exercise was not so advantageous to him as it frequently is to many other diabetics.

April 21st.—Urine 38 ounces, sp. gr. 1020. The amount of sugar is very small, and only reduced after boiling some time with Fehling's solution and then standing some time.

April 25th.—Rep. mixt. 4tis horis.

April 26th.—Urine 45 ounces, sp. gr. 1021. No trace of sugar even after prolonged boiling and waiting some time. He still suffered much from dyspepsia, for which he was ordered nightly a pill containing belladonna, nux vomica, and aloes.

May 7th.—Weight 10 stone 2 lbs. Since last note his urine has varied in quantity from 41 to 48 ounces, with a sp. gr. of from 1015 to 1022. Occasionally a little sugar is present.

May 9th.—Rep. mixt. 6tis horis.

May 16th—Rep. mixt. ter die.

May 25th.—Omit mixture.

June 9th.—Patient had not been doing so well lately. He had suffered much from dyspepsia, with constipation, alternating with occasional attacks of diarrhœa. This was much improved by a mixture containing bismuth and strychnine. His urine has varied in quantity from 30 to 45 ounces with a sp. gr. from 1020 to 1030. He was ordered ʒiss. of ergot every night and morning.

June 14th.—Rep. mixt. ter die.

June 29th.—This date patient was discharged. Weight 10 stone 5 lbs. Urine 45 ounces, sp. gr. 1023. But for his dyspepsia, which had much improved, he had nothing to complain of. Appetite good, no thirst; skin moist, and perspired readily. Only required to get up once at night to pass water. The physical signs at the apex of each lung remained much the same as on admission, with the exception that the percussion note had improved. His urine contained a slight amount of sugar, more than for some weeks previously. He was ordered to continue his diet as when in the hospital, and to take ʒj of ergot three times a day.

Since his discharge he has appeared regularly in my out-patient room, and his condition, with the exception of one or two attacks of diarrhœa readily checked by opium, catechu, and bismuth, has been most satisfactory. On no occasion has there been any sugar present. When last seen, August 7th, he was returning to his work. The sp. gr. of the urine was 1030, and he said he passed no more than when in the hospital. He continues the same diet.

Those, who, like myself, carefully watched the progress of the case from day to day, were much struck by the beneficial results obtained by the use of ergot, though of course it cannot have all the credit, as the dieting doubtless assisted. It will be noticed that at the commencement of the treatment, when the patient was allowed an almost unlimited diet, subsequently to a period of strict dieting, that not only the amount of urine passed was very much diminished, but also the specific gravity was much reduced, while the general condition proportionately improved and the patient slightly gained in weight. Again, towards the close of his stay in the hospital, when the ergot was left off but the dieting continued, the patient lost ground considerably, but improved on resuming his medicine. His own opinion, whatever it may be worth, was very strongly expressed in favour of the ergot.

In the case of another patient who came under my care towards the close of 1878 with the history of twelve months illness, of which the most prominent symptoms were excessive thirst, profuse diuresis and progressive weakness, and a loss in weight of 4 stones, almost equally satisfactory results were

obtained. Under a free meat diet and the use of ergot his urine diminished in quantity from 118 ounces to between 40 and 50, and the sp. gr. from 1040 to between 1022 and 1028, and for a time sugar entirely disappeared. It however subsequently was discoverable in small quantities, and since his discharge whenever he has come under my notice some has always been present. On the whole, however, his general condition has been most satisfactory, and whenever he feels out of sorts he comes to my out-patient room for a little more of the medicine that did him so much good before.

With regard to the dieting of hospital diabetics, some such diet as that ordered to Thos. A., and described above, has appeared to me the most useful. The principal requisite is that while it shall contain no sugar-producing substances, it shall be such that they can easily obtain it when at home, and that it will not produce disgust. Thus I readily allow some very thin slices of well-toasted bread in preference to gluten or similar forms of prepared bread, since, even if they relish it, which is not frequently the case, their scanty means will not enable them to obtain it when they have left the hospital. I place great reliance on a free supply of meat, allowing my patient from $\frac{3}{4}$ to $1\frac{1}{2}$ pounds of cooked meat in the twenty-four hours, and I place no restriction on the amount of fluids drunk, though I generally find that 2 pints of milk and 1 pint of beef-tea will satisfy all their wants.

In conclusion, I may say that I have never seen in any case in which I have pushed the ergot, even to one ounce of the liquid extract in the twenty-four hours, any interference with the circulation such as can be made out either with the ophthalmoscope or by means of feeling the pulse, nor have any unpleasant symptoms declared themselves even when the treatment has been long continued. Possibly it has once or twice given rise to some dyspepsia, though this has not been the case with any of my diabetics. In the case of Thos. A., the dyspepsia, which was one of his most troublesome symptoms, was unconnected with the use of the ergot, and was even diminished by it. His occasional attacks of diarrhœa were proved, too, to be unconnected with the use of that drug.

ON CHRONIC ACCIDENTAL POISONING.

BY HENRY BARNES, M.D.,

Physician to the Cumberland Infirmary.

Whenever the history of medicine in recent years comes to be written, due prominence must be given to the rapid strides which have been made in the department of sanitary reform and preventive medicine. Stimulated and guided by an enlightened and unselfish profession, the public has at length awakened to the fact that human life is of as much importance as that of the brute creation, and as much entitled to protection from the inroads of preventible diseases. We have already obtained legal enactments for the prevention of overcrowding, for providing healthier dwellings for the working classes, for checking the spread of enthetic and zymotic diseases, for putting a stop to the adulteration of food and drink, and so forth. But much remains to be done, and every one ought to do what he can for the general good of the community. We have long known that various mineral poisons may accidentally enter the human economy and cause serious symptoms of disease, sometimes even threatening life, and yet no legal measures have been taken for preventing or rendering impossible such forms of chronic poisoning as one frequently meets with. When such cases occur among workmen it is often sufficient to point out to the employer the hazardous nature of the occupation. There are many safeguards that may be made use of, but very frequently from carelessness or indolence these are laid aside.

Lead Poisoning.—Perhaps the most common form of accidental poisoning that one meets with is that by lead. Most practitioners probably have met with it among painters and

other workers in lead, or from the drinking-water being rendered impure by contamination with lead. The latter source is not so common as it used to be. Chemistry has made us familiar with the salts in water which act injuriously on lead, and waters containing these salts should never be kept or conveyed in leaden pipes. Painters, of course, must work with lead, but I think they as a class have been taught by the best of all teachers—experience—that certain precautions are necessary, and cases of lead colic, or other forms of lead poisoning, are less frequent among them than used to be the case in my earlier years of practice. The following case is quoted for the reason that the source of contamination was unsuspected both by the patient and by his employers. It occurred in the works of a firm of commercial and colour printers.

The patient, R.G., a labourer, was admitted into the Cumberland Infirmary under my care on October 29, 1879. He was a complete wreck from mal-nutrition. He had for many months had no work, but seven weeks before admission he obtained a job at the works above mentioned. In about a fortnight he began to complain of a bad taste in his mouth and noticed his gums were sore. A fortnight later severe pains invaded his limbs. For a week before admission he suffered from constipation and had slight attacks of colic. On admission his gums were seen to be swollen and sore, and he had a distinct blue line on the dental edges of the gums. The outer surfaces of the teeth were also discoloured. He had occasional pains in his arms and a constant pain down the back of the thighs and legs, and also in the groins, occasionally passing down over the knees. He had slight paresis of the extensors of the arms and legs. His bowels were constipated. These symptoms left no doubt that the patient was suffering from lead poisoning, and indeed traces of lead could be detected in the urine and in the perspiration. Under the usual treatment of iodide of potassium and purgatives a speedy amelioration in his condition was obtained. The source of the poison had yet to be discovered. He did not know any probable cause for his illness, but remembered hearing that the man who preceded him at the works had left on account of illness. So far as he was aware there was no lead at the works which he had to do with. His work

consisted chiefly in dusting tin plates. I visited the works for the purpose of making a personal investigation. His employer did not know of any lead being used in the works. The patient had correctly stated the nature of his employment. It was to take tin plates upon which pictures had been printed in colours and dust them in the open air, removing some white powder which had been put upon the plates for the purpose of bringing out the colours. The occupation was not a laborious one, and so far as was known in the works no other cases of lead poisoning had occurred. The powder was commercially known as flake white, but of its composition the employer was ignorant. Many tons of it had been used, but it was only recently that it had been used as a dusting powder, having previously been used in the form of a thick paste. Suspicion at once became directed to the powder. An inquiry was addressed to the manufacturer asking for information as to its composition; its use was suspended, and I obtained a sample of it for examination. An analysis showed that it consisted almost entirely of carbonate of lead, and on further inquiry I find that this substance is known in commerce as flake white. There could now be no doubt as to the source of the poison in R.G.'s case, and on further inquiry several other cases of lead poisoning were found to have occurred among the workpeople at the same works about this time. Another white powder free from lead was substituted and no further cases have occurred. The reply from the manufacturer was concise but startling. It was to the effect that "the lead base in flake white if used as a dusting powder will poison your workpeople."

It is not right that such substances as this should be sold under the apparently harmless name of "flake white," and the Sale of Poisons Act might be usefully extended in this direction. Its composition should always be stated, and people using it would do so at their own risk. If it had been called "white lead," which in reality it was, it would have been used with greater caution, and certain safeguards adopted. According to Christison the manufacture of this substance was formerly attended with great danger, and in a large manufactory near Edinburgh lead-colic used to be extremely common, but there, by insisting upon thorough cleanliness and abandoning

the process of dry grinding and substituting for it the pulverization under water, the disease was extirpated for several years.

Relation of Lead Poisoning to Gout.—There is another effect which the accidental introduction of lead into the system sometimes produces, and which is very singular. In his discoveries concerning gout, Dr. Garrod has shown the close connection which exists between this disease and lead-poisoning. In gout the urates are retained in the blood, uric acid is almost absent from the urine, but is abundant in the blood; the urates in the blood have a special affinity for certain structures, and during their deposition in the joints excite that form of acute inflammation which constitutes gout. Now it is found by physiological experiment that lead checks the elimination of urates from the blood by the kidneys; it diminishes the uric acid of the urine, thus increasing that of the blood, and thereby produces the conditions which excite gouty inflammation. There is also the fact that the administration of a salt of lead to a gouty person free at the time from an acute attack, will at once develop acute gout. It is well to bear this clinical fact in mind, but the following case teaches one, I think, something more:—

A New Exciting Cause of Gout.—On November 12, 1879, I was summoned to see an old patient suffering from a most aggravated attack of gout in both feet. The pain was most severe, and there was high fever. About three years before he had had a slight attack (the first one in his life), but it was so slight, and only attacking one foot, that he accepted my diagnosis with hesitation. On making inquiry as to the exciting cause it was not at first very evident. There had been nothing unusual in the patient's habits or food, no undue exposure to cold or wet; no history of local injury; no unusual exercise; no indulgence in indigestible food; no error in diet, and no indulgence in wine or beer, and no depressing or violent emotions. I noticed, however, that the house had been recently painted, the patient had been going out very little, and had slept in his bedroom immediately after it was painted.

Cases are on record in which colic and paralysis have occurred in persons who have slept in newly painted rooms (Taylor

On Poisons second edition, p. 485), and I think there is no doubt the patient's gout was due to this cause on the present occasion. It would be well, therefore, in future to warn our gouty patients of the risks they run by staying at home while they are having their houses painted. I am not aware of any similar case having been recorded, but this case made a strong impression on my mind, and is, I think, deserving of record.

Chronic Arsenical Poisoning from Wall-papers—It is, however, more for the prevention of chronic poisoning with arsenic that legislative interference is required. Although it is upwards of twenty years since the mischievous results arising from the use of aceto-arsenite of copper as a colouring agent for wall-papers, toys, confectionery, artificial flowers, and so forth was first noticed, the poison is still continued in use, and cases of poisoning from this source every now and then come under observation. In the spring of the present year a report was presented to the Medical Society of London, "On Arsenical Poisoning by Wall-papers, Paints, &c.," on the part of a Committee of the Society appointed to investigate the subject. This report is published in the *British Medical Journal* for February 21, 1880, and is based upon 224 replies received as the result of the issue of 1,500 circulars addressed to Fellows of the Society and other members of the profession. Only fifty-four of the 224 correspondents were able to afford particulars of cases of poisoning by this agent which had come under their personal observation, but their remarks had reference to more than 100 cases. In twenty-four instances the poisoning occurred in the persons of medical men themselves, eight in members of their families, a fact which "is taken as evidence of the difficulties attending the diagnosis of this form of poisoning, and as also showing that the better opportunities for observation afforded by a medical man in his own house may lead to the detection of mischief which, from its insidious nature, baffles ordinary tests, or by assuming symptoms of a general character is often erroneously treated as indicating a different class of ailments." Thirty-six medical men report that they have traced cases of poisoning as due to arsenic in paper, five to paint, and several others have traced its presence in stockings, wearing apparel, artificial flowers, bedsteads, and toys.

The conclusion at which the Committee arrived is that some check should be imposed upon the free and unrestricted sale of poisoned articles before mentioned, with a view to making it compulsory that such articles should be advertised, and, I would venture to add, duly labelled as containing deleterious matter, in order that purchasers might be aware of the danger they were incurring in their use. Before taking any further steps, however, the Committee think a further effort might be made to obtain some more general expression of opinion from the profession, and thereby obtain "a crushing and incontestable weight of evidence which could with confidence be brought under the notice of Parliament." It is with a view of adding my mite to this mass of evidence required that I am induced to bring forward two cases of chronic accidental poisoning with arsenic that have come under my own observation. A short note regarding the first case was furnished to the Committee, but it is given here more in detail.

It occurred about four years ago. A friend of mine had his dressing-room re-papered. This dressing-room was occasionally used as a bedroom by one of his sons, and after sleeping in it for a few weeks this lad, about ten years of age, began to exhibit signs of ill health. He was languid, easily tired, lost his appetite, and had other dyspeptic symptoms. One morning he had slight conjunctival inflammation, and I was sent for to see him. His father asked me if I thought his symptoms could in any way be due to arsenic. He informed me that previous to having the paper hung he had taken the precaution to ask the paper-hanger whether the paper being a green one was at all likely to contain arsenic, but was at once assured that the colour on the paper was not an arsenical green. The symptoms being such as would be produced by arsenic, and there being also a gas-fire in the room, the dry heat from which would dry the wall paper very quickly, and thus allow the dust to come from it more readily, and perhaps also render volatile any arsenic which the paper might contain, I thought it my duty to submit the suspected paper to a chemical examination. Marsh's test and Reinsch's test were both used, and arsenic was found to be present in large quantities. The paper was removed, and the boy quickly recovered.

The next case was a more serious one, and the diagnosis more difficult. The patient was an old lady upwards of eighty years of age. On the 8th of November, 1879, she got an attack of bronchitis and was confined to her bedroom, having the fire kept constantly on. At the end of a fortnight bilious vomiting supervened, but this was not at first considered of much importance, as it was remembered that during a previous illness the same symptom had appeared, and had continued until the patient was able to get out again. The vomiting proved obstinate, and was apparently unaffected by any treatment. The patient got weaker, the tongue became coated with a white fur, irritability of the bowels set in, there being diarrhœa with a good deal of mucus in the stools; this condition, alternated with constipation; thirst, and dryness of the throat, were complained of, and I noticed a little redness of the conjunctiva, and also slight eczema on one wrist. I did not at first suspect arsenic as a cause of her symptoms, but their persistence in spite of every kind of treatment at length aroused my suspicions. When I mentioned to the patient and her family that I thought the symptoms in her case might be in some measure due to arsenical impregnation, the source of the poison being in the wall-paper, the idea was positively scouted. I was assured that the paper had been on the walls for upwards of a dozen years, that the room had been constantly occupied, that no complaint had ever been made of it before, and that therefore it could not possibly do any harm. The symptoms, however, being such as would be caused by arsenic, and my opinion that they were in this case due to that poison being confirmed by the discovery of traces of arsenic in the urine, I obtained a small piece of the wall-paper for examination. It was a buff-coloured paper with a small green flower upon it, and examination showed that the green colouring was due to arseniate of copper. This was on the 8th of December. The paper was condemned and ordered to be removed, and for that purpose the patient had to be removed to another room. Here, however, an unexpected difficulty arose. Every room in the house had green paper on the walls. The only available bedroom on the same landing had no fireplace in it; its wall-paper was decidedly arsenical looking, and it was therefore hardly suitable for a bronchitic and

arsenical poisoned patient. The drawing-room was also on the same floor, its paper was green, but not a bright Scheele's green, and that room was selected. She was moved into this room on the 9th of December. All the other symptoms continued, she was very restless, and early this morning it is noted she had a suffocative paroxysm, and she also complained of a frequent desire to micturate—symptoms which are known to occur from chronic arsenical poisoning. On the 11th there was no amelioration in her condition, on the contrary, she was worse; the removal to the drawing-room had done no good; she complained of pain, heat and tenderness in the epigastrium, and also great heat of the body. I examined the drawing-room paper to-day, and found that it also contained abundance of arsenic. The dining-room paper was also tested and found to be arsenical. The kitchen paper was a green one, and had only recently been put on. I cut a piece of it away and thereby obtained a small piece of the paper which was underneath, and which was also a green one. The upper or outer paper was free from arsenic, but the one underneath contained that poison. Under these circumstances there was no object to be gained by moving the patient into any other room in the house, as arsenic was to be found everywhere. I therefore hurried the paper-hanger in his work of re-papering the bedroom first occupied. When removing the paper, it was found that the reprehensible practice of putting one paper over another had here been followed, and the paper brought to light in the process of peeling the walls was found to contain abundant evidence of arsenic. The bedroom was ready for occupation again on the 13th, and the patient was at length placed in a room free from all poisonous contaminations. Her system, however, had been rudely shaken, and the symptoms did not greatly improve. On the 16th the report is that she feels rather better, but the vomiting continues. Arsenic was found to be still present in the urine. On the 17th Dr. Maclaren saw her with me in consultation, and quite confirmed the accuracy of my diagnosis. On the 19th she is reported to have had a better night, and says she feels better. She still vomits occasionally; the pain and tenderness in the epigastric region is gone; the eczema and conjunctival redness has disappeared, the tongue is cleaner, and

the intestinal irritation is subsiding. From this time I ceased to take notes of her condition. She never recovered sufficiently to be able to leave her bedroom. She was able on some days to sit up for a short time, but continued until the last to have vomiting once daily or every other day. There was no obvious cause for it except irritability of the stomach or gastric catarrh. All other arsenical symptoms disappeared. No traces of the poison could be found in the urine. She rallied a little about the new year, but afterwards became gradually weaker, and died from sheer old age and exhaustion on the 12th of February, 1880.

I do not think that one can attribute her death directly to the agency of the poison, inasmuch as she had been at least two months free from its influence, but I think that the system received such a shock, and the vital powers were so lowered, that she was never able to make any headway again. It ought to be mentioned that although there were several other people living in the same house and attending upon the patient, no one else showed any symptom of the poison. This, however, is not unusual, and is not an argument in favour of this case being due to any other cause than arsenic. All the attendants were strong healthy people, and were in the habit of going out almost every day, thereby breathing pure air, and not like the patient, always living in a poisoned atmosphere. It is also a well known fact that some people are much more susceptible than others to the influence of the poison.

The conclusions which I would draw from a consideration of these cases are as follows:—

1. Wall-papers containing arsenic are in common use. (This conclusion is strengthened by the fact which I have ascertained within the last few days. I obtained a new pattern-book of wall-papers from a local dealer, took a sample of every green paper in the book, and find that out of forty samples, three contain arsenic.)

2. These papers are capable of producing serious and even alarming symptoms in some persons inhabiting the rooms in which such papers are hung.

3. Legislative interference in the direction suggested by the Committee of the Medical Society of London is desirable.

4. Until such legislation is obtained, members of the

profession should take every opportunity of urging their patients to purchase only such wall-papers as are guaranteed "free from arsenic."

I should in conclusion just like to say a word as to the tests for arsenic. Reinsch's test is easy, but it takes time. Marsh's test is not free from danger, unless you go to the expense of a special apparatus. In an improvised apparatus which I had several times used successfully, I had one day rather a bad explosion, although I had allowed more than double the time mentioned in text-books to elapse before applying the lighted taper to the jet from which the hydrogen was escaping. This test also takes up a good deal of time. There is, however, a test which commends itself to the busy practitioner. It is very easy, and very quickly done, and especially applicable for paper hangings or any other suspected fabric. Immerse the suspected paper in strong ammonia, on a white plate or saucer; if the ammonia becomes blue, the presence of a salt of copper is proved; then drop a crystal of nitrate of silver into the blue liquid, and if any arsenic be present, the crystal will become coated with yellow arseniate of silver, which will disappear on stirring. This test is not so well known I think as it should be. It is mentioned in some of the text-books, but I am not aware to whom the credit of its first introduction is due.

ON CATARRHAL PNEUMONIA AND TUBERCLE IN THE HUMAN LUNG.

BY D. J. HAMILTON, M.B., F.R.C.S. ED., L.R.C.P. ED.,

Demonstrator of Pathology, University of Edinburgh, Pathologist to the Edinburgh Royal Infirmary.

(*Continued from page* 120.)

ON SECONDARY TUBERCLE OF THE LUNG.

BY the term "Secondary Tubercle" of an organ I mean, as previously explained, tubercle which has followed the softening of a caseous mass situated in the organ itself. The tubercle in such a case is the secondary disease, and is to be regarded in the light of a complication. In the lung there are two main causes of such local, infecting, caseous centres, namely, Interstitial Pneumonia or Cirrhosis with Bronchiectasy, and Catarrhal Pneumonia in the third stage. Both of these are accompanied by tubercular deposits; but as they are more abundant and less obscured by surrounding complications in interstitial than in catarrhal pneumonia, I shall consider tubercle occurring in it first.

When treating of Cirrhosis of the Lung as a sequela of bronchitis, it was shown that tubercle is common in this disease. The anatomical characters of the cirrhotic lung were at that time fully discussed, but the relationship of the tubercles to the surrounding interstitial increase were, for obvious reasons, merely hinted at. It will now be convenient, under the title of "Secondary Tubercle of the Lung," to describe more fully the special characters of the tubercles, with particular reference to the relationship in which they stand to the cirrhosis.

The clinical history is of great importance in understanding the pathology of this disease, as the symptoms often act as a guide in following the order of events. Instances must be familiar to every practitioner, although, curiously enough, it does

not seem to be generally understood that it is tubercular. The reason is that it is a lesion of adult life, whereas the general supposition is that tubercle is essentially a disease of youth and childhood. This idea is totally fallacious, tubercle being a commoner disease in persons over twenty-one years of age than in those below it. Catarrhal pneumonia is a disease of childhood and youth, and is frequently described as tuberculosis, while this, merely because it is found in the adult, is almost invariably diagnosed by the physician as phthisis pulmonalis. I grant that there are cavities in such lungs, but *they are not phthisical*, and the disease *does not originate* from a catarrhal pneumonia. Over a third of the cases diagnosed as ordinary catarrhal phthisis are, I find, examples of cirrhosis, and what I wish in this paper specially to bring before the notice of the profession is the entire difference between it and pulmonary phthisis of catarrhal pneumonic origin. It seems to me that the physical signs accompanying it have not been clearly enough observed in the light of its being tubercular, and the treatment in each surely ought not to be the same, seeing that they are so essentially different in their nature. The prognosis would require to be very guarded according as the one or the other disease is under consideration. During the last eighteen months I have made post-mortem examination of thirty-seven adults who died from what would ordinarily be called pulmonary phthisis, and, of these, fifteen were instances of tubercle accompanied by interstitial pneumonia, while the others were of catarrhal pneumonic origin. It is, therefore, clear that this affection is by no means rare, and its pathology, accordingly, deserves the closest attention.

As before mentioned, this is a disease of adults, and its onset is very insidious. A cough with slight bronchitic expectoration is usually first observed. The cough comes and goes, and is worst in winter. The patient loses flesh, and has a haggard look. There is slouching of the shoulders, hoarseness, and marked retraction of the supra and subclavicular spaces. I am not aware that hæmoptysis is a characteristic symptom of this lesion. Slight attacks of pleurisy, accompanied or not by pleurodynia, and a general feverish condition, are noticeable features. The fingers become clubbed, and there is occasionally some œdema of the feet. These symptoms continue for several

years, the patient not usually being incapacitated from following his employment. Some complication, often renal, at length arises, and this brings about the fatal result.

The post-mortem appearances are the following: the body is much emaciated, and the upper part of the chest has a retracted appearance, sometimes more on one side than the other. Flattening, both below and above the clavicles, is very evident. It is due to the shrinking of the lung substance, and to the traction of the cirrhosed lung upon the tissues of the lower part of the neck and the upper part of the anterior wall of the thorax.

The pleuræ are invariably united by fibrous adhesions, usually continuously, but at other times only at intervals. There may be fibrinous adhesion at one part, while the remainder of the pleural cavity is obliterated by fibrous union. At the same time the pleuræ are greatly thickened, and are coarsely fibrous and leather-like. The thickening is greatest towards the apex, and this no doubt contributes to the dulness frequently experienced on percussion, in this neighbourhood. It may reach the extent of a quarter of an inch or more. If the visceral layer of the pleura is carefully examined several groups or rows of tubercle nodules may be seen in it. They have the usual characters of tubercle in this situation, and are grey and gelatinous.

The organ is shrunken, and its contour is irregular, from the retraction or collapse of some lobules and the over-distension of others. The disease is sometimes unilateral. When the lung is removed from the chest, shreds of the subpleural thoracic tissues may be seen adhering to the costal layer of the pleura. If percussed after removal, some parts of the organ give a hyper-resonant note, while others are dull. It feels hard and fibrous throughout, and nodules of small size may be felt lying in its interior.

When incised, several cavities of various sizes can be noticed. The largest of these are usually at the apex, and they may range in dimensions from a hazel-nut up to that of a small orange. They are invariably *bronchiectatic* in character, and, as their appearance and mode of formation have already been fully discussed in the article which treated of cirrhosis of the lung as a complication of bronchitis, it will be unnecessary to say anything further of them at present. They contain a quantity

of pultaceous softened cheesy-looking material, composed of caseous catarrhal products.

The whole organ is beset with interlacing bands of dense fibrous tissue. Their density is always greatest around the bronchiectatic cavities, where they sometimes feel almost like cartilage. The lung tissue is often so compressed between such a bronchiectatic cavity and the pleura that it is barely visible. The fibrous hyperplasia takes place chiefly in the situations where interstitial fibrous tissue is most abundant, that is to say, in the deep layer of the pleura, in the interlobular septa, and in the adventitious coats of the bronchi and branches of the pulmonary artery. The interlobular septa can be seen as thick cords running down from the pleura to the dilated bronchi.

Gumma-like nodules, varying in size from a mustard-seed to a pea, are sometimes seen in certain parts of the lung. They are round in shape or have a sinuous border, and are cream-yellow in colour and caseous in consistence. They are sharply circumscribed, and, like gummata, are generally situated in parts of the organ where the fibrous thickening is densest. When carefully examined, they are found to be portions of cicatricial tissue which have necrosed on account of obliteration of a small branch of the pulmonary artery, as in syphilitic gummata. The manner in which the small arteries become obliterated is illustrated in Figs. 32 and 33 of my former series of articles on "Bronchitis." The caseous matter of which they are composed sometimes softens in the centre, and from this, as an infecting source, secondary tubercles may be locally propagated.

An important point to consider at present is the disposition of the tubercles in such a lung. The situations they occupy depend upon the position of the lymphatic vessels radiating from the caseous sources of infection. In this respect they resemble, in their distribution, the course taken by tubercle of the peritoneal coat of the intestine adjacent to a caseous ulcer of the mucous membrane. The caseous matter is absorbed by the lymphatics and induces the growth of tubercle within them. Such being the case, it would naturally be expected that the tubercles should be most numerous near the sources of infection, and that they should diminish in number in a direction outwards from this.

Now, the sources of infection, in this disease of the lung, are

undoubtedly to be sought chiefly in the bronchiectatic cavities above alluded to. Catarrhal products accumulate in these, they caseate and ferment, and the débris is absorbed by the surrounding lymph channels. The tubercles, accordingly, run in lines, or are collected in masses around the bronchiectatic cavities, owing to the distribution of the lymphatic vessels.

The bronchiectatic cavities usually originate at the apex, this being the region where the cirrhosis is greatest. The tubercles, which abound in this situation, are so incorporated with the interstitial tissue that their outline cannot be distinctly observed. In the lower parts of the lung, however, the cirrhotic new formation may not be so dense, and here the individual characters of the tubercles can best be noticed. Indeed, the tubercle deposits sometimes seem to be the only abnormality in the lower part of the organ, the cirrhosed tissue being confined to the upper lobe. They are of the size of a mustard-seed, not so large as a millet-seed. They are grey and gelatinous in appearance, and are inseparably adherent to the lung tissue. They may be cut out, and, if squeezed between two pieces of glass, feel like little masses of cartilage, and are with difficulty destroyed. Next to the immediate vicinity of the infecting caseous centres, the adventitious coats of the arteries and bronchi, the interlobular septa, and the deep layer of the pleura are their commonest seats. They follow, in fact (and this is significant in regard to the channels of conveyance of the caseous matter), the course taken by inhaled pigment particles.

Although the anatomical features of the nodules are alike in primary and in secondary tubercle, yet their lines of distribution are quite different. For, whereas in the primary form they are scattered universally throughout the organ, in secondary tubercle they follow the course of the pulmonary lymphatic vessels contained in the periarterial and peribronchial sheaths, the interlobular septa, and the deep layer of the pleura. Very little of the infecting virus appears to be taken up by the blood-vessels. Tubercles are occasionally met with in the liver or kidney in such cases, but only in small numbers; whereas, in primary tubercle of the lung, where the blood-vessels are the means of dissemination of the caseous virus, many organs are simultaneously tubercularized. In the primary form the tubercles are not found more abundantly in the interlobular septa and pleura than in

other parts, while the bronchial glands are by no means necessarily the seat of tubercular deposits. In secondary tubercle, on the other hand, the bronchial glands are invariably much enlarged. They contain many tubercles, usually placed, along with pigment particles, at the periphery of the gland, in the neighbourhood of the lymph sinus—again indicating that the lymphatics have been the means of transmitting the irritant. The first lymphatic glands appear, as with inhaled pigment, to have the power of arresting the further progress of the irritant, so that adjacent parts do not become tubercular. It is, as already stated, the exception to find other organs than the lung infected with tubercles in the secondary disease, clearly showing that its propagation must have occurred through channels having a limited area of distribution—that is to say, through the lymphatics.

The same localized distribution of secondary tubercle occurs in catarrhal phthisis, in which disease, as is well known, general tuberculosis is not often met with. When the caseous softening occurs gradually there seems to be much more liability to the débris being absorbed by the lymphatics than by the blood-vessels. There is usually a non-vascular area around a chronic caseous deposit which apparently prevents the softened mass being removed by the blood-channels, while the lymphatic radicles are capable of taking up a small quantity of it. I have seen a lymphatic gland, in an instance of general primary tuberculosis which had suddenly caseated and softened, and in which the caseous matter had been rapidly absorbed. The wall of the cavity which resulted was covered by a plexus of congested blood-vessels, and, no doubt, these had been the means of removing the contents of the cavity, and of distributing them generally throughout the body. In a chronic softening there is not any such vascular plexus to be seen on the wall of the softening part, but a hard layer of caseous substance intervenes between the surrounding blood-vessels and the fluid contents at its centre. This apparently prevents the blood-vessels taking up the débris in any quantity.

Very different is it where a caseous gland, for instance, undergoes rapid and complete softening, and where the surrounding blood-vessels are in direct contact with the abscess-like cavity which results. Here the irritating virus is absorbed in large

quantity by the blood-vessels, and is carried throughout the body in the blood-current, giving rise to a widespread eruption of tubercle. The more gradually the caseous accumulation and softening occur, the less likelihood apparently is there of general tuberculosis being excited.

The lung is congested in the cirrhotic form of secondary tubercle. The blood also has a bright red colour. The cause of the congestion is the difficulty experienced by the blood in passing through the cirrhosed and tubercular organ. The capillaries are pressed upon by the cicatricial tissue of the organ, and the circulation within them is consequently rendered more difficult. The right ventricle of the heart is always dilated or hypertrophied in such cases, for a similar reason. The bright red colour which the blood has is owing to hyperoxygenation, due to the delay in its transmission.

The bronchi contain catarrhal fluid, and expectoration is sometimes copious during life, in the later stages of the disease. Catarrhal expectoration is of course much more a symptom of this variety of tubercle of the lung than of the primary. The disease in this is usually a bronchial lesion to begin with, and the bronchiectatic cavities become a fertile source of catarrhal discharge as the disease progresses. The high tension of the circulating blood keeps the bronchial mucous membrane in a congested state, so that the epithelium can never be perfectly formed.

In Fig. 22 is represented a portion of a lung in an instance of the disease I have just described. It was taken from a part where the cirrhotic tissue was not developed to a very great extent, but where the tubercle nodules were abundant. Four tubercles are seen at *a, a, a, a;* and, on comparing them with the primary tubercle represented in Fig. 13, it is evident that they are the same bodies, although their integral parts are more highly organized. It will be observed that the nodules are quite distinctly demarcated, yet that they are in part continuous with each other by intervening fibrous tissue (*h*). This is seen only where the tubercle growth has been very chronic. It is never observed in the acute primary form.

In all the nodules one or more large giant cells can be noticed (*c*), from which there radiate processes, forming, by division and subdivision, the reticulum previously described. The size to

which the giant cells may reach in secondary tubercle of the lung is truly enormous, so that, as will be seen from this drawing, they become objects easily recognisable with a magnifying power of fifty diameters. It can also be noticed that some of the

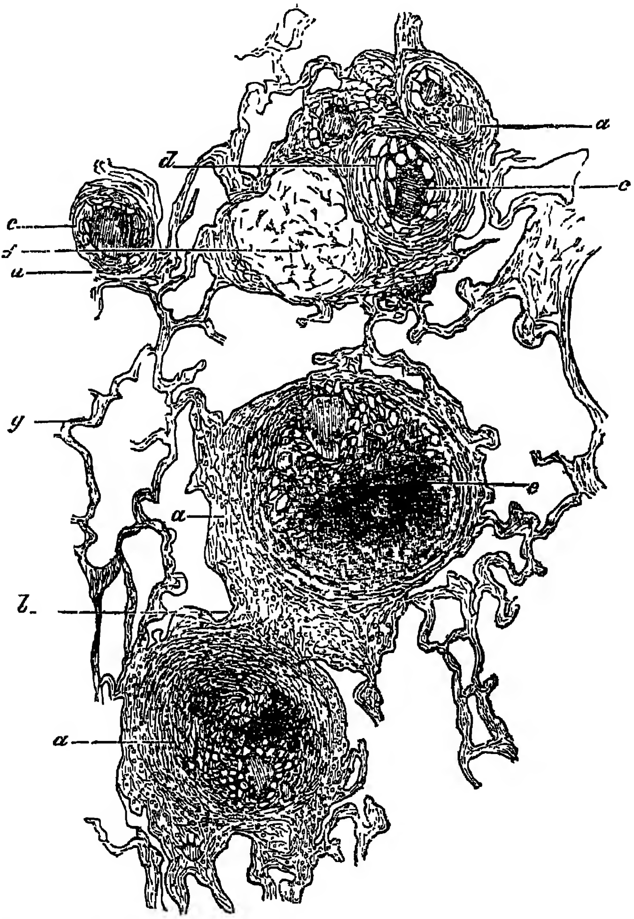


FIG. 22.—Secondary tubercle of the lung, × 50 diams. *a, a, a, a,* four tubercles; *b,* thickened interstitial tissue uniting two tubercles; *c,* giant-cells; *d,* giant-cell reticulum; *e,* centre of a tubercle caseating; *f,* a giant-cell system which has become converted into a mass of fibrous tissue.

tubercles, not all of them, are caseous in the centre (*e*). In one of the nodules the giant cells and also part of the reticulum are caseous.

(*To be continued.*)

Fasting Girls; their Physiology and Pathology. By William A. Hammond, M.D. 8vo. pp. 76. New York: G. P. Putnam Sons.

The recent fast of Dr. Tanner gives additional interest to this work, which was written on account of the excitement caused by another case of fasting in New York some time ago. The object of the author was, as he states in the preface, to do something towards the removal of a lamentable degree of popular ignorance, so great that when the assertion was made that a young lady lived for fourteen years without food of any kind, thousands of persons throughout America at once believed the declaration. The book contains five chapters:—1. Fasting in the Middle Ages. 2. Abstinence in Modern Times. 3. Abstinence from Food, with Stigmatization. 4. The Brooklyn Case of Fasting, which led to the publication of the work, and 5. The Physiology and Pathology of Inanition.

Numerous cases of fasting in the Middle Ages are given, in some of which the person was said to have been nourished by angels, and in others by the devil. Many cases, both of the diabolical abstinence from food and of the holy fasting, exhibited manifestations of hysteria. One of the chronicles details the symptoms, and ascribes them without hesitation to devilish agency. Thus he says:—"The functions of the organs of nutrition are sometimes profoundly altered in the possessed, and these alterations are manifested by violent cramps, which show the extent to which the muscular system is affected." The hysterical lump in the throat is a frequent phenomenon in possession. "A young girl in the Valley of Calepino had all her limbs twisted and contracted, and had in the œsophagus a sensation as if a ball was sometimes rising in her throat, and again falling to her stomach. Her countenance was of an ashen hue, and she had a constant sense of weight and pain in the head. All the remedies of physicians had failed, and as evidences of possession were discovered in her, she was brought to Brignoli

(a priest) who had recourse to supernatural means, and cured her." The ability to live on the Holy Sacrament, and to resist starvation by diabolical power, died out with the Middle Ages, and was replaced by the "fasting girls." One of these, Margaret Weiss, was only ten years of age, and yet her powers of deception were so well developed that after being watched by the priest of the parish and Dr. Bucoldianus, she was considered free from all juggling, and really to live, grow, walk, and talk like other children of her age, without either food or drink. This greatly staggered the doctor who observed her, who asked very pertinently, "Whence comes the animal heat, since she neither eats nor drinks, and why does the body grow when nothing goes into it?" But notwithstanding this he seemed to be fully convinced of her abstinence.

In several other cases which are reported all attempts to discover the imposture failed, but as we approach modern times the detection becomes more frequent. About sixty-five years ago a woman, named Ann Moore, declared that she did not eat, and many persons volunteered to watch her. After continuing to do so for three weeks they reported that hers was a real case of abstinence from food of all kinds. Many people from all parts of the country visited her, leaving her with donations to a considerable amount. Doubts having again arisen, Ann consented to a second watching, but, unluckily for her, amongst the committee was a Dr. Fox, and his son, Mr. Francis Fox, who suggested that the bedstead, bedding, and woman in it should be placed in a weighing-machine. It was thus ascertained that she lost weight daily. The watch was very strict, two of the committee being in the room night and day, and at the expiration of the ninth day Dr. Fox found her evidently sinking, and told her she would soon die unless she took food. After a little prevarication the woman signed a written confession that she was an impostor, and had "occasionally taken sustenance for the last six years." She also stated that during the first watch of three weeks her daughter had continued, when washing her face, to feed her every morning by using towels made very wet with gravy, milk, or strong arrowroot gruel, and had also conveyed food from mouth to mouth in kissing her, which it is presumed she did very often.

The well-known case of Sarah Jacobs, the Welsh fasting-girl, is given at considerable length. Here, as in all the other cases, the declaration that she fasted entirely was accepted as a fact by numbers of people, but on the 9th of December, 1869, at 4 P.M., the watch by four experienced nurses from Guy's Hospital began, and on the 17th of December, at about half-past three o'clock, the poor girl died of starvation.

In the next chapter the performances of Palma d'Oria and

Louise Lateau are described, but their cases are considered chiefly in reference to their fasting, and not so much to the phenomena of stigmatization which accompanied it.

The Brooklyn case of Miss Fancher, who was said to have taken no food for fourteen years, and to have been possessed, also, of the power of clairvoyance, induced Dr. Hammond not only to write the present work, but to offer publicly to place a cheque for a thousand dollars inside a paper envelope, and to give it either to Miss Fancher or to any charitable institution she might name if she would only describe the cheque accurately without allowing the envelope to pass out of the sight of those who were watching her. He also offered to give another thousand if she would allow herself to be watched night and day for a month, by members of the New York Neurological Society, and if, at the end of the month, she had not taken food voluntarily or as a forced measure to save her from dying of starvation.

In the fifth chapter Dr. Hammond sums up the physiology and pathology of inanition, and he concludes that although it is impossible, so far as we know, for individuals to continue to exist for months and years without the ingestion of nutriment into the system, it is undoubtedly true that, under certain circumstances, life can be prolonged for days and weeks without any food of any kind going into the organism. The body, like every other machine, performs work and requires fuel, but the quantity of food or fuel required by the system varies in accordance with the work which has to be performed. The ploughman, other things being equal, consumes more than the watchmaker, just as the locomotive engine burns more fuel than the little engine which runs a sewing machine. When little work is done, a very little food may go a long way, and the body itself can, to a certain extent, be used up to supply the force required for functions without the necessity for immediate restoration by means of food, but to this power there is a limit beyond which it is certain death to go. Chossat determined this point by experiments performed upon pigeons, guinea-pigs, rabbits, &c., and found that death generally occured when the body had lost four-tenths of its original weight. Five-tenths, or one-half, appeared to be the extreme loss of weight which the body could endure without death resulting. Similar observations to those of Chossat on the lower animals have been occasionally made on human subjects, in consequence either of accident or disease. Thus in Belgium, in 1683, four colliers were confined in a coal-pit for twenty-four days without anything to eat, and having nothing to live on but a little water. Cases of prolonged abstinence often occur amongst the insane. Dr. Willan relates the case of one man who lived for sixty days on nothing but a little orange juice.

Desbarreaux Bernard relates another in which life was prolonged for sixty-one days, although there was total abstinence excepting a little broth taken once; and Deportes refers to another woman who continued to live for two months with nothing but a little water. Another case is reported by Dr. McNaughten, in which a young man died after fasting for fifty-three days, during which he had taken no food, although he drank a good deal of water.

From the observations collected by Dr. Hammond in this work it is clear that in ordinary cases fasting cannot be prolonged very much beyond a week, but that under exceptional circumstances, and especially in some abnormal conditions of the nervous system, life may be preserved for a much longer time without food. It is much to be regretted that Dr. Tanner should have put himself to so much inconvenience and pain during his prolonged fast, without taking such precautions in regard to watching as would have placed the fact of his abstinence beyond doubt. Unluckily, however, instead of putting himself under the observation of the New York Neurological Society, which would have provided watchers thoroughly trained, and whose evidence would have established the fact of his abstinence as well as it was possible for any testimony to do; he chose his watchers from amongst the Eclecties, who occupy on his side of the Atlantic much the same position that homœopaths do here. Men who know Dr. Tanner personally, however, believe in his integrity, and consider that he really has fasted for the whole forty days. If this be the case, it is very remarkable, inasmuch as Dr. Tanner has not lain quietly in bed, doing no work and husbanding his resources by reducing the action of the heart and lungs to a minimum, but has gone through a good deal of exertion, mental and bodily, in walking and riding about, and receiving and entertaining visitors. If Dr. Tanner has really succeeded in fasting for forty days, his success must no doubt be attributed in a great measure to the external warmth of the summer weather in New York, which has reduced to a minimum the waste necessary for the maintenance of the bodily temperature. It is just possible, indeed, that the high external temperature may have actually supplied a certain amount of energy to the body, but this is a point on which at present we have little or no information. Of late years we have seen examples of endurance such as would formerly have been reckoned incredible, as in the case of the long walks taken by Weston, and the long swims of Captain Webb, and it is possible that Dr. Tanner's fast is another instance of endurance which, though of a different sort, may be classed with theirs. But it is much to be regretted that, unlike the performances of Webb and Weston, the genuineness of Dr.

Tanner's exploit has not been satisfactorily tested by witnesses on whose testimony implicit reliance could be placed.

To all who are interested in this subject, Dr. Hammond's little book will prove both amusing and instructive.

A Practical Treatise on Sea Sickness, its Symptoms, Nature, and Treatment. By George A. Beard, A.M., M.D. 8vo. pp. 74. New York: E. B. Treat.

At this season of the year, when many persons are crossing the Channel, on their way to or from the Continent, the subject of sea-sickness aquires a special interest. In this little treatise the author discusses the pathology, symptoms, and treatment of the malady. He considers it to be a functional disease of the central nervous system, and not a disorder of the stomach, liver, or digestive apparatus. Its effects he considers to be injurious rather than beneficial. Sometimes, no doubt, it does good, but, as Mr. Beard justly remarks, typhoid fever sometimes does so also, but no one on that account seeks an attack of typhoid fever, and all the benefit of a sea voyage can be obtained without suffering sea-sickness. Its cause is purely mechanical, being occasioned by the movements of the ship. It attacks horses, dogs, fowls, and human beings, but is most likely to attack, and is most severe on, those who are most sensitive and nervous. Thus it is that Americans suffer more than Europeans, and women, especially delicate women, more than men. It can, in the majority of cases, the author believes, be entirely prevented or greatly relieved by proper treatment. This consists, first, in the preliminary use of the bromides, in large doses, and preferably the bromide of sodium. These should be taken from one to three days before sailing, so that the individual may become mildly bromised before reaching rough water, and this kind of mild bromism should be kept up during the voyage if necessary. Secondly, in the use of sulphate of atropia, in doses of from $\frac{1}{100}$ to $\frac{1}{25}$ of a grain, hypodermically or by the mouth, repeated with sufficient frequency to produce great dryness of the mouth. This treatment may be adopted either alone or in combination with the bromides. In some cases atropia is sufficient without the bromides. It prepares the way for them, and enables the stomach to bear them, and to bear food and other medication during the attack. Thirdly, the powdered citrate of caffein, in two or three grain doses, should be used for the sick headache. Pills of half to one-third of a grain of Cannabis Indica are excellent to relieve the sick headache of sea-sickness, and have the advantage over caffein that they do not cause sleeplessness, which caffein would sometimes do if used in the latter part of the day. Those who carry out

this line of treatment properly and firmly may spend their time either in their berths or on deck, as may be most agreeable to them. They can eat what they like best, and take their meals either on deck or below.

In his preface the author asks the readers of this work to tell him whether they find any other bromide or composition with bromide preferable to the bromide of sodium which he recommends, and whether any other powerful nerve-sedative, such as Hyosciamin, may not in some cases take the place of the bromides.

Hay Fever; its Causes, Treatment, and Effective Prevention. By CHARLES HARRISON BLACKLEY, M.D. Second edition, revised and enlarged. 8vo. pp. 281. London: Baillière, Tindal, and Cox.

IN the first edition of this work Dr. Blackley propounded the view that hay fever was due to the irritation of the nasal mucous membrane by pollen grains which had settled upon it and begun to send out pollen tubes into its substance, just as they would have done if they had fallen upon the stigma of a plant. In this edition he reviews the opinions held regarding the causes of hay fever, and gives an account of his experiments on the effect of benzoic acid, coumarine, odours of various kinds, ozone, dust, pollen, and light, and heat in producing hay fever. His experiments with benzoic acid give an entirely negative result, as do those with coumarine, an odoriferous principle found in some grasses, and in plants belonging to several natural orders. Odoriferous principles produce various results. The odour of camomilia, for example, causes frontal headache, nausea, and giddiness, but no symptoms resembling hay fever. The inhalation of the spores of a microscopic fungus (penicillium glaucum) brought on a severe attack of hoarseness, passing into complete aphonia, and ending in a sharp attack of bronchial catarrh. The result of these experiments to some extent agrees with the observations of Dr. Salisbury, who states that he has seen mould generated on damp straw produce many of the symptoms of measles amongst the troops engaged in the American War. The occurrence which first drew the author's observation to pollen as a cause of hay fever was his noticing that, at certain periods of the year, the inhalation of dust produced hay fever, and one day a carriage which passed him in a narrow lane raised a cloud of dust which brought on a violent attack of sneezing, continuing for about an hour. On passing over the same road the following day, he found that by means of a little of the dust he could again bring on the attack.

Microscopical examination of the dust which had this effect showed it to contain a large number of pollen grains. On then making a series of experiments by applying the pollen of various plants to the nasal mucous membrane, he found that it possessed the power of producing hay fever, both in its asthmatic and catarrhal forms. This power, with rare exceptions, is possessed by the pollen of almost all the plants experimented with. Those belonging to the natural order of graminacea have it in a marked degree, but there are plants belonging to other orders which have it almost, if not quite, to an equal extent.

The disturbance caused by the pollen is due partly to its mechanical and partly to its physiological action. If the vitality of the pollen is partially destroyed before it reaches the mucous membrane, both actions are more or less prevented.

Another cause of hay fever is said to be the odour given off by certain animals; the author thinks, however, that many of those instances are due to the presence of pollen grains in the hairs of cats, rabbits, or guinea-pigs, and that these, and not the odour proceeding from the animals themselves, are the true cause of the disease. Light and heat, although they may have some power to aggravate, do not produce the malady.

In this edition the author takes up two most important questions which were left unsettled in the first. One of these related to the quantity of pollen necessary to produce hay fever, and the other to the treatment and prevention of the malady. From a number of experiments the author concludes that less than $\frac{1}{40000}$th of a grain of pollen inhaled in each twenty-four hours suffices to bring on the malady in its mildest form, and $\frac{1}{3427}$th of a grain will keep it up in its severest form. He finds that quinine, applied in the form of a saturated solution to the nostrils several times a day, according to Binz's plan, gave no relief, but rather increased the irritation, and salicylic acid and salicylate of soda were also useless. Bromide of potassium slightly delayed the attacks, but was of little service, nor were the iodide of potassium or iodide of mercury of any greater value. The author seems to believe in homœopathic doses of arsenite of quinine, and uses it in doses of $\frac{1}{1000}$th of a grain four times a day. When increased to $\frac{1}{100}$th of a grain four times a day, he states that it caused a mild degree of cinchonism, an assertion which rather inclines us to take, *cum grano salis*, the other remarks of the author. He recommends that the patient should avoid the inhalation of dust as much as possible, and to relieve the irritation of the eyes and face by bathing them first in tepid and then cold water several times a day, taking care to include in the process those parts of the hair that are exposed to the atmosphere. The hair forms an efficient covering round the pollen, and when disturbed will give rise to

irritation when it comes in contact with the eyeball. He also recommends a lotion, consisting of ten grains of sulphate of copper to three ounces of rose water and twelve of distilled water, or of sulphate of zinc in a somewhat weaker solution.

The other recommendations of the author refer to treatment with homœopathic drugs, and we therefore think it utterly useless to give them.

The Surgeon's Pocket-Book. By Surgeon-Major J. H. PORTER, late 97th Regiment, &c. Second Edition, Revised and Enlarged. Charles Griffin and Co. 1880. 16mo., pp. 319.

IT is with an unfeigned feeling of satisfaction that we greet the appearance of a second edition of this little book, which, although enlarged, may still fairly claim to be a pocket-book. The wondrous amount of information it contains, the illustrations numerous and truthful, the diet-scale and formulary, all contribute to render it the most perfect work of its kind. It may be recommended not only for military but for civil practice, but of course is better adapted to the requirements of the former. There is but one regret which is associated with this edition, the regret that he, to whom we are indebted for it, has ceased to dwell among us, and that his useful and energetic life has not been longer spared to the service of which he was so bright an ornament.

Surgical Emergencies. By WILLIAM PAUL SWAIN, F.R.C.S., Surgeon to the Royal Albert Hospital, Devonport, &c. Third Edition. London: J. & A. Churchill. 1880. Fcap. 8vo., pp. 220.

A BOOK admirably adapted to the purpose it is intended to serve, and most valuable to those engaged in civil practice. The only suggestion we are tempted to make is that Mr. Swain should in future adopt the modern practice of speaking of the more movable or more distant bone as the dislocated bone.

On Aneurism: especially of the Thorax and Root of the Neck. By RICHARD BARWELL, F.R.C.S., Surgeon to Charing Cross Hospital. With illustrations. London: Macmillan and Co. 1880. Crown 8vo. pp. 118.

THE greater part of the contents of this book has already been published in the *Transactions of the Medico-Chirurgical Society*, (vol. lxii.). But even if no new matter had been added, the importance of the subject would amply suffice to justify a separate publication. That Mr. Barwell has met with a marvellous success in the treatment of aneurism at the root of the neck by the distal ligtaure, cannot be contested, and a careful study of the

cases he has reported leads one to believe with him that success has been mainly due to very careful antiseptic dressing, and to such cautious application of the ligature that the inner coats of the arteries were not damaged. It must, however, still be left for experience to decide whether catgut or the aorta of an ox is the more reliable material for ligatures, for Mr. Barwell's successes were obtained with both. We think the author might be a little more explicit in his directions with regard to the thickness and width of the ribbon ligature on which he lays so much weight. May we also suggest that the name of the distinguished professor at Kiel is Esmarch, not Esmarsch ?

Clinic of the Month.

The Treatment of Asthma.—Dr. Berkart states that the most common and severe form of asthma is œdema of the lungs, as it occurs in the obese and the cachectic, as well as in those suffering from valvular lesions of the heart, from gout, and from renal disease (uræmic asthma). It is invariably the result of a temporary failure of the left ventricle, while the right is still able to act: and develops itself, either in the midst of apparently perfect health with the suddenness of a fainting fit, or as a rapid exacerbation of an existing cardiac derangement. To understand its pathology, it is well to remember that constitutional and local causes tend to impair the nutrition of the cardiac muscles to an extent varying from the cloudy swelling of the individual fibre to its brown atrophy or fatty degeneration. The heart, notwithstanding these changes, continues to perform its function in accordance with the requirements of the organism, and without painful perception of the patient. It is only when an increased demand is made upon its energy, and on the accession of an irritation, that the organ manifests its inherent weakness, by its inability to meet the one and to resist the other, even if both are so slight as to be powerless to cause disturbance in a healthy person. Œdema is thus readily produced by imperfect ventilation of the lungs, as it arises from the rapid extension of bronchitis, from embolism of a large branch of the pulmonary artery, and from excessive meteorismus. The reason is that the blood, abnormally rich in carbonic acid, irritates the centres of circulation and respiration, and that finally while the right ventricle is able to empty part of its contents into the pulmonary artery, which possesses no tonus, the left is incapable of doing so on account of the increased tension of the systemic vessels. In these circumstances the subcutaneous injection of one-sixth of a grain of morphia acts like a charm. As soon as the morphia is absorbed, which requires a longer time than in health, the painful oppression at the chest and the hacking cough disappear: the noisy and

frequent respiration becomes quiet and slower, the cyanosis of the face and lips gives way to a flush, the cold and clammy skin becomes warm and moist, the contracted artery widens and fills, the heart regains its previous force and rhythm, and with them return its impulse, its sounds and its murmurs, whilst the consequences of its temporary failure as regards the lungs subside more or less completely. There is subsequently neither languor nor drowsiness, even in those who at other times are very susceptible to the influence of narcotics. Morphia merely counteracts the effect of the abnormal quantity of carbonic acid in the blood, and with attainment of that object its influence is exhausted. (*The British Med. Jour.*, July 17, 1880.)

The Microscopic Examination of Water.—The chemical examination of water leaves, as is well known, much to be desired from a sanitary point of view. It informs us of the condition with which organisms may be associated, but gives no information as to the presence of organisms. The microscope, as at present used, reveals only the coarser forms of animal life, and those only with uncertainty. M. Certes has endeavoured to ascertain how far it can be made to yield information of more direct value. The discovery of the microscopic organisms has been hitherto very much a matter of chance. Patience and skill are only of slight help. Fortunately, however, certain chemical re-agents kill these organisms without changing their appearance: osmic acid is of especial value for this purpose. Once destroyed, they sink to the bottom, and if enough of the liquid has been employed, they may thus be collected in appreciable quantity. The value of this method is shown by the following experiment. If a test tube be broken, and the water it contained be contaminated by dipping into it the extremity of a rod which has been placed in an infusorial liquid, and it is then treated with osmic acid, the organisms will be found intact, and with readiness by the aid of a microscope. In the examination of water M. Certes employs a one-and-a-half per cent. solution of osmic acid. One cubic centimetre of this solution will suffice for thirty or forty centimetres of water, all animal and vegetable organisms being by it rapidly killed and fixed. In a few minutes, in order to lessen the blacking action of the osmic acid, as much pure water as the test tube will hold is added. In certain waters rich in organisms the microscopical examination may be made in a few hours. If the water be comparatively pure, twenty-four or forty-eight hours must be allowed to pass. The liquid, with the exception of the last one or two centimetres, may then be decanted. The detection of the organisms in the residue is facilitated by the employment of colouring agents, such as picrocarmin, methyl violet, and logwood. It is always well to

introduce the colouring agent mixed with glycerine: the organisms are thus better strained, and can, if desired, be preserved. (*The Lancet*, Aug. 7, 1880.)

Cerium Oxalate in the Treatment of Cough.—Dr. Robert Cheesman read before the State Medical Society of New York a paper in which he discussed the value of oxalate of cerium (cf. Clark, *Practitioner*, vol. xx. p. 276) in the cough of phthisis. The results at which he arrived were as follows:—"1. Cerium oxalate may be given safely in doses of ten grains or more three times a day, for many days in succession. 2. The only symptom noted from such doses is a slight dryness of the mouth for the first few days. 3. It is probably more efficient when taken dry upon the tongue. 4. Its effects are not fully apparent until it has been taken two or three days and continued about the same length of time after its use is suspended. 5. For chronic cough it is best taken on an empty stomach early in the morning and at bedtime, with other doses during the day, if required; the initial dose for an adult being five grains. 6. It is in the majority of cases an efficient cough medicine, at least for a considerable time, and it is very valuable as an alternate with other drugs used for that purpose. 7. It does not disturb the stomach as do opiates and most other cough remedies; but on the contrary it tends to relieve nausea and to improve digestion. 8. The different preparations on the market are not of equal value, and when success is not obtained with one, another should be substituted." (*The New York Med. Record*, June 12, 1880.)

Tonic Glycerine.—There are many patients to whom cod liver oil cannot be administered, as it destroys their appetite, and produces dyspepsia. Dr. Larmande highly recommends "tonic glycerine" as a substitute for the oil in such cases. This is made by adding 30 drops of tincture of iodine, and 5 grains of iodide of potassium, to 9½ ounces (by weight) of glycerine. A table-spoonful should be taken a quarter of an hour before each meal. This generally restores the appetite, and removes constipation if it be present. For children or delicate persons, one-sixth part of the glycerine may be omitted, and replaced by syrup of rasp-berries. (*Lyon Médical*, April 25, 1880; *The Glasgow Med. Journ.*, June, 1880.)

Recent Investigations on the Action of Drugs.—Dr. von Anrep has studied the action of cocain, the active principle of the coca leaves, in the Physiological Institute at Würzburg. He draws the conclusion that cold-blooded animals are more sensitive to its action than warm-blooded animals. Its chief action appears to be on the nerve centres. In frogs it first

paralyses the terminations of the sensory nerves, and afterwards abolishes reflex action. In the mammalia it first stimulates all the nerve centres, and especially the psycho-motor centres. This general excitation is followed by a slight enfeeblement. Small doses increase reflex action: large doses do not paralyse it entirely, as in the case of the frog. Respiration is quickened, except by fatal doses. In frogs the power of the heart is lessened so as to lead to arrest in diastole. In mammalia the heart's action is accelerated, and strong doses are necessary to cause a retardation. The blood pressure is increased by the stimulation of the vaso-motor centres: large doses should naturally have the opposite action, and lower the blood-pressure. The inhibitory nerves of the heart are readily paralysed by medium doses The striated muscles are not directly influenced by cocain. The pupil is dilated by it as powerfully by the internal use of the drug as by its instillation into the eye. The peristaltic movements of the intestines are accelerated Acute poisoning by cocain causes muscular spasms, and in consequence an elevation of the rectal temperature: when there are no convulsions, the rectal temperature falls. The secretions of the several mucous membranes are lessened Certain motor disturbances can only be explained on the assumption that cocain has an action on the semicircular canals: the symptoms suggest that the drug modifies the pressure of the endolymph in the internal ear, and thus effects a stimulation of the terminal filaments of the auditory nerve. Death appears to result from asphyxia, caused by respiratory paralysis, the heart continuing to beat for some minutes after apparent death. (*The Lancet*, July 31, 1880.)

Antagonistic Action of Quinine and Atropin.—An interesting contribution to the facts relating to the antagonism between the actions of drugs has been supplied by Panteljeff with regard to quinine and atropin. The salts employed were the chloride of quinine and the sulphate of atropin, and the experiments were made upon dogs, rabbits, and frogs. An injection of quinine beneath the skin of a frog in summer arrests the heart in diastole: but a subsequent subcutaneous injection of atropin causes it at once to resume its pulsations. The appearance of the heart, when its action is arrested by quinine, is as if the blood pressure on the heart were greater than the cardiac walls could contract upon. If atropin be injected first, so as to cause an acceleration, this may be arrested by quinine. With winter frogs the effect of the quinine was more frequently to cause a gradual retardation in the action of the heart, which was only slowly arrested, with loss of reflex action and death. The injection of atropin did not prevent this, but still more rapidly retarded the heart. Microscopic examination of

the vessels of the web of the foot showed that the quinine caused a narrowing of the small arteries to one-half of their previous calibre, while atropin dilated the vessels. In rabbits it was found that, when the heart's action was arrested by quinine, atropin caused it again to beat, and the auricles began to contract before the ventricles. In both dogs and rabbits the blood pressure in the carotid rose after the injection of quinine, when the pulse was rendered less frequent. It was found that immediately after the injection the blood pressure suddenly fell, but after a few seconds rose to a higher degree than before the injection. In small doses the pulse is often accelerated during the increased pressure, but with large doses the pulse is retarded from the beginning. When repeated injections are made, every injection causes first a sudden fall of pressure, with retardation of the pulse: then the pressure rises, to fall again after a new injection. This initial fall in the blood pressure is probably due to a sudden contraction of the vessels of the lungs, hindering the passage of the blood into the left ventricle and the aorta. The cardiac contractions become at the same time less frequent, but stronger. The arteries of the aortic system then contract, and cause an increase in the blood pressure and at the same time an acceleration of the pulse. Larger doses have a direct influence on the heart, so that later the cardiac action becomes retarded and the blood pressure falls. The vagi remain excitable to electricity, but their division exercises no marked influence upon the pulse, especially when the respiration is retarded by the action of quinine. Subsequent injection of atropin accelerates the pulse, even when the vagi have been divided. In only one observation upon dogs was an arrest of the heart by quinine prevented by atropin. The increase of pressure caused by quinine was disturbed and retarded by the preceding injection of atropin. Direct application to the heart of frogs showed that not only can quinine arrest the action of the heart but that it can also, under certain circumstances, act as a stimulant to excite it to action, and that the effect depends upon the condition in which it happens to be. (*The Lancet*, July 31, 1880.)

General Exanthema caused by Calomel.—Engelmann reports the case of a man forty-two years of age who took three doses of calomel of fifteen centigrams each in the afternoon. Two hours afterwards his face became dry and swollen, and the skin red. These phenomena rapidly spread all over the body. The following day the patient presented the appearance of a person suffering from serious erysipelas—the face was swollen, the eyelids could be opened only with difficulty, the skin was of a brilliant red colour, the conjunctivæ injected,

the tongue white, while the entire buccal and pharyngeal mucous membrane presented an intense red colour. This extraordinary redness of the skin extended all over the cutaneous surface, but was more marked on the parts exposed to the light. The axillary temperature was 40° C. and the pulse 120. The patient complained of weakness, anorexia, and of a sensation of burning and pricking all over the body. The physician in attendance, much puzzled by these strange phenomena, was aided in the diagnosis by the patient himself, who stated that he must have taken some mercury in the white powder, as he explained that he was extremely susceptible to the action of that drug. On two former occasions he had experienced the same symptoms—once after having taken some mercurial pills: a second time after having spent the evening with some friends who had amused themselves by burning "Pharaoh's Serpents." The affection got well, spontaneously, in eight days. There was desquamation of the cutis. (*Berl. klin. Wochensch.*, No. 43, 1879; *The Dublin Journ. Med. Sci.*, August, 1880.)

Experimental Study on the Treatment of Hepatic Colic.—M. Laborde, in the *Revue médicale* for Feb. 7, 1880, gives the following *résumé* of the results obtained from his physiological experiments concerning hepatic colic:—(1) The excretory bile ducts are endowed with contractile power, and may consequently enter into a spasmodic state under the influence of direct or indirect stimulation; this contractility is of the nature of that of the smooth muscular fibres of organic life, and the existence of these fibres in the walls of the canals is demonstrated by histological anatomy, perfectly in accord here with experimental physiology. (2) The mucous membrane of these canals is exceedingly sensitive, as shown under the action of excitants more or less intense by pain and by reflex phenomena, of which the immediate manifestation is spasm of the canals. (3) These phenomena are particularly determined by the presence and contact of foreign bodies (biliary calculi), whose spontaneous migration is thus rendered very difficult, and is only accomplished after a greater or less length of time, with the peculiarity that these bodies are carried towards and into the gall-bladder. (4) Anæsthetic and anti-spasmodic medicines are the most appropriate in the treatment of this morbid state, of which it is easy to realise experimentally the mechanical conditions. (5) These medicines, notably morphia, chloroform, and hydrate of chloral, act by exercising at once an anæsthetic and a paralysing influence, from which results the cessation of the spasmodic state, the distension of the canals, and the accumulation of bile, which acts upon the foreign body as a *vis a tergo*, and pushes it toward the intestine.

(6) The combination of chlorhydrate of morphia with chloroform or with hydrate of chloral, that is, the simultaneous administration of these medicines, is the most powerful means of obtaining the desired results, namely: insensibility of the biliary canals, prevention of pain, and the favourable influence upon the migration and rapid extrusion of the foreign bodies. (*The Chicago Med. and Surg. Examiner*, June, 1880.)

The Pathology and Treatment of Hydrophobia.—Dr. Duboué, of Pau, who has written an exhaustive treatise on this subject, concludes that the virus is not absorbed, but passes insensibly along the nerves from the point of contact towards the spinal cord. It passes slowly centripetally, but, having reached the *medulla oblongata,* it returns quickly by the sensory nerves to the extremities. The symptoms of the disease begin when the poison reaches the medulla oblongata. The duration of the period of incubation depends on the distance the poison has to travel from the wound to the bulb; it is shorter, therefore, in children than in adults, in wounds of the face than those of the limbs, &c. The earlier pathological changes are microscopic, and consist in an increased opacity of the nerve cells; and these cells, along with a certain number of nerve filaments, soon become granular. This is followed by congestion of various organs, more or less marked and visible to the naked eye. On this theory of nerve conduction, the author lays down the following line of treatment:—(1) To destroy the virus at the wound. (2) To prevent it reaching the medulla oblongata if it has not been previously destroyed. (3) Failing this, to lessen the sensibility of the medulla oblongata during the period of incubation; and (4) to continue this throughout the attack by the injection of various medicaments into the veins; to counteract, in short, the marked tendency to asphyxia.—Dr. Brochin, in the *Gazette des Hôpitaux,* December 23, 1879. (*Glasgow Med. Journ.*, May, 1880.)

Extracts from British and Foreign Journals.

Therapeutics of Strabismus.—M. Boucheron read a paper before the Academy of Medicine in Paris on the therapeutics of strabismus, in regard to the cure of the affection by mydriatics without operation. Basing his argument on the physiological fact that accommodation for short distances is governed by the convergence of the eyes, M. Boucheron proposes to combat the excessive convergence of hypermetropic eyes, and the consequent convergent strabismus, by temporarily suppressing accommodation through paralysis of the mechanism of accommodation with atropin. This plan of treatment was brought before the Academy of Sciences in March, 1879, and the results which have been obtained from it may be thus summed up. The *sine quâ non* of success is the intermittent character of the strabismus, since this indicates that the internal recti have not yet undergone that retraction and shortening which is a consequence of their habitually vicious position. The instillation of sulphate of atropin (3 centigrams to 10 grams of distilled water) should be made on the first appearance of the squint, before there is any alteration in the convergent muscles. Atropin should be dropped into both eyes, to such an extent as is required to paralyse the mechanism of accommodation in each. One or two drops of the solution recommended above dropped in morning and evening will be sufficient to produce the required effect. The atropin should be employed until the squint has disappeared when the child looks closely at anything. This treatment puts a hypermetropic squinting child into the same condition as one who is hypermetropic but does not squint. The length of time during which the atropin must be used, is therefore dependent upon the age of the child when the treatment was commenced, as well as upon the duration of the affection. The strabismus as a rule disappears in two or three weeks, but it exhibits a tendency to recur for several months. In the cases which have been observed the atropin causes no inconvenience, but if it is not well borne, it should be replaced

by other mydriatics, as for example, duboisin In some cases also, myotics, such as eserin, which render accommodation mechanism immovable by causing contraction of the ciliary muscle, may modify the relation which exists between accommodation and convergence to such an extent as to cause cessation of the strabismus. Mydriatics appear, however, to yield more certain results than do myotics. In nine cases of intermittent convergent strabismus occurring in children, in eight this method of treatment gave successful results. (*Le Progrès médical*, July 10, 1880.)

The Treatment of Scabies.—Mr. William Sang states that when scabies is once perfectly recognised its treatment is in most cases simple and satisfactory. The first point to be attended to is, of course, isolation of the patient and all his belongings. Then some external application to destroy the insect must be used. There are many preparations that will do this, and consequently cure the disease. Almost every specialist seems to have his own favourite ointment or lotion. Sir Robert Christison is in the habit of using a lotion of chloride of lime, one to forty or sixty parts, and applied five or six times a day, or continuously, with wet cloths. The case is generally cured in eight days. Hardy uses a sulpho-alkaline ointment, composed of carbonate of potass, sulphur, and lard. Dr. M'Call Anderson prefers using styrax ointment, which he says "is clear-looking, has a pleasant aroma, and soothes rather than irritates the skin." Erasmus Wilson uses the old sulphur ointment, and he thinks, with the profession generally, it is the remedy that is most extensively used. Mr. Sang is generally in the habit of directing his patient to have first a warm bath in the evening, using soap and water freely; then, after being dried, to have the sulphur ointment well rubbed into the skin all over the body, but paying particular attention to the clefts of the fingers, wrists, and forearms—in fact, where the eruption is generally found,—the head and face, of course, are excepted; then to go to bed in this state, and in the morning have a second bath to wash it all off and clean the skin. In many cases this is sufficient, but, if necessary, it may be repeated a second or third time after an interval of one or two nights. He has never seen this treatment fail, and therefore very seldom uses any other. The chief objection to it is its rendering the exhalation from the body very offensive; but if used legitimately, and as he has described, this happens only in a very slight degree, since this condition is chiefly the result of excessive use of the remedy. A preparation of sulphur and lime is used very much in hospitals and schools. It has the advantage that a single application is sufficient. This is true; but from what the author has seen himself it has some serious

disadvantages. It is very irritating, and always leaves the skin in a very rough, scaly condition, almost like pityriasis, and in severe cases of scabies, where the hands are pustular, although curing it generally causes an inflamed condition of the skin often more difficult to cure than the original disease. In private practice, therefore, he never thinks of using it, and even in public institutions he would not be inclined to make it the regular remedy. The late Professor Bennett was in the habit of recommending the use of simple lard which he merely smeared over the body so as to smother the insects. In very young children Mr. Sang generally does this, but after the age of four or five years prefers to use a specific. (*The Edinburgh Medical Journal*, June, 1880.)

On the Digestive Action of Papaya on Living Tissues.—M. Bouchut has already proved that the juice of the *papaya*, as well as the digestive ferment (papain) which it contains, possesses a principle which, in union with proteid materials (fibrin, glutin, raw meat, milk), has all the characteristics of assimilable peptones. Continuing his experiments with the diluted juice of papaya as well as with papain, he has found that living tissues, normal or pathological, such as adenomata and cancers, are digested and converted into peptones in exactly the same way as are the dead ones. Thus the injection of one gram of a solution containing a fifth of papaya juice into the brain by means of a hypodermic syringe, produced a digestion of that part of the cerebral tissue which came in contact with the fluid. The affected portion, examined twenty-four hours after death, was seen to be yellow and softened, forming a pulpy and occasionally reddish mass. The animals succumbed in two or three hours, after becoming collapsed, and paralysed on one or both sides. When a gram of the same solution was injected into the muscles, post-mortem examination showed a very marked change in the muscular tissue, which had become softened, pulpy, and gelatinous, being composed of digested muscle. Analogous results were obtained with pathological tissues, and M. Bouchut believes that these experiments may thus be of therapeutic value. (*Arch. gén. de Med.*, July, 1880.)

Treatment of Puerperal Fever.—Dr. Bell finds that no remedy is so effectual in purifying the system in cases of puerperal fever as the Edinburgh preparation of the tincture of the muriate of iron, when given regularly in full doses frequently repeated (*e.g.* thirty drops every two hours). The great error in the employment of this medicine is the timidity shown in giving it in sufficient doses: in consequence its good effects have been questioned in other diseases of a zymotic character, such

as erysipelas, diphtheria, and scarlet fever. It has a remarkable effect in moderating the pulse and diminishing the secretion of pus Dr. Bell thinks it right, however, to warn the practitioner against trusting to the new preparation of iron called the tinct. ferri perchloridi, which differs from the tinct. ferri. muriatis in its formation, its medicinal effects, and in its analysis. (*The Edinburgh Medical Journal*, July, 1880.)

Oil of the Eucalyptus as an Antiseptic.—Professor Schulz on purely theoretical grounds recommends that the oil distilled from the leaves of the eucalyptus should be used as a substitute for carbolic acid in Lister's dressings, on account of its non-poisonous properties. Buchholtz finds that this oil prevents the development of bacteria when it is present in the proportion of 1-666·6, whilst carbolic acid does not do so until the amount reaches 1-200; he also shows that it has a pleasant smell, and that it is soluble in alcohol, oil, and pure paraffin The eucalyptus oil, moreover, can be taken in the relatively large dose of 5 grams in the course of two and a half hours. For purposes of spray and irrigation the alcoholic solution should be mixed with water, when a milky emulsion lasting for a considerable time will be produced. (*Centralbl. f. die. med. Wiss.*, May 1, 1880.)

Long-continued Ileus Cured by Large Injections of Ice-water.—Dr. Kormann, of Coburg, reports the following case: A woman, forty-five years of age, was seized suddenly with violent pain in the right inguinal region, accompanied by continued vomiting and constipation; examination revealed increased resistance and dulness in the ileo-cæcal region. The bowels were moved, at first, by injections, and the pain was controlled by hypodermics of morphine, but the vomiting and the tenderness in the iliac region persisted. On the sixth day, after a large dose of calomel and jalap, a distinct sausage-shaped tumour formed in the right side of the abdomen over the site of the cæcum, and the patient fell into a state of collapse. The bowels had not moved for four days, and a soft doughy mass, consisting probably of retained fæces, could be felt above the tumour. Large injections of warm water were given repeatedly without result, and on the tenth day, when the patient's condition was most desperate, Dr. Kormann decided to try ice-water. He accordingly injected about two quarts of ice-water into the gut, and then manipulated the tumour gently with his hand, and while doing so felt it disappear with a distinct gurgling noise. The patient at once felt relieved from the intense pain that she had been suffering, and two hours later she had a large soft passage from the bowels. The right side of the abdomen remained tender for a few days, but the patient

rapidly recovered, and was able to leave the hospital at the end of two weeks. The passages were examined for pieces of necrosed intestine, but none could be found. Dr. Kormann thinks that this case began with a slight intussusception of the ileum into the cæcum, the lumen of the gut still remaining partially open, and that the purgative forced down a larger portion of the ileum, producing complete obstruction. The case is notable both for the duration of the intussusception and the facility with which it was relieved by the ice-water injection. (*Berliner Klin. Wochen.*, No. 48, 1879; *New York Med. Journ.*, March 20, 1880.)

Glycerin in Diabetes.—In two cases of diabetes mellitus occurring in elderly persons, who had previously suffered from rheumatic arthritis and angina pectoris, Dr. L. Y. Hölst observed the diabetic symptoms rapidly and for a considerable time disappear. The treatment in these cases consisted of a markedly animal diet and the use of glycerin, as recommended by Schultzen; the successful result v. Hölst believes to be mainly due to the glycerin. The author also expresses his belief that diabetes is only a symptom of various diseases, and that for this reason the different methods of treatment act in such different ways. (*Petersbürg med. Wochenschr.*, Nos. 3 and 4, 1880; *Centralbl. f. d. med. Wiss.*, May 1, 1880.)

Salicylic Acid in the Treatment of Rheumatic Diseases of the Eye.—Dr. Hotz believes that the salicylates may be of use in the treatment of rheumatic affections of the eye. He instances cases of rheumatic iritis which have been successfully treated by him with salicylate of soda, and draws attention to its use more particularly in those cases which do not appear to do well under the ordinary treatment, although atropin develops its full effect upon the iris: the pupil is completely dilated, and there are no adhesions between the iris and the capsule of the lens. (*The Chicago Med. Journ. and Examiner*, May, 1880.)

Iodoform in the Treatment of Chronic Otorrhœa.—Dr. Czarda recommends iodoform as a remedial agent in those cases of otorrhœa in which the tympanic mucous membrane is thickened, swollen, and hyperæmic—a condition which is due to chronic catarrh of the mucous membrane. Trachomatous growths of the mucous membrane, when small, may be treated with iodoform, but when they become large palliative measures must be adopted, and in obstinate cases it may be necessary to resort to an operation. The iodoform is applied by blowing it into the tympanum. (*Wiener Med. Presse*, No. 5, 1880.)

On the Therapeutic Action of the Cortex Quebracho.—In No. 19 of the *Berliner klin. Wochen.* for 1879, Penzoldt

published a very interesting paper on quebracho, in which he stated that he had obtained most striking and unexpected effects from that drug in different forms of dyspnœa, but that as a febrifuge it had failed in his hands. Dr Berthold, of Dresden, has since then experimented with the remedy in fifteen cases of intense dyspnœa, with the following results: In a severe case of asthma convulsorum, a teaspoonful of the tincture of quebracho gave speedy relief, and three doses at hourly intervals effected a complete cure In a case of emphysema with asthma a teaspoonful of the tincture was administered every three hours; the dyspnœa did not yield till the third day, but the asthmatic attack was decidedly shortened by the remedy. In a case of emphysema complicated with pulmonary catarrh and pregnancy, the respiration fell in one day from forty-eight to thirty-two under the use of quebracho. In a case of pleurisy, and one of chronic pulmonary catarrh, the remedy caused no improvement at all in the dyspnœa. In a case of mitral insufficiency and stenosis, and in two cases of fatty heart, it exerted a very decided palliative action on the dyspnœa. Of six cases of phthisis with great dyspnœa, only two obtained any relief from the quebracho, but in these two cases the relief was very marked. In one of these cases of phthisis the diarrhœa stopped after the first dose of the remedy. Dr. Berthold has found the alcoholic extract of quebracho, that is, the resinous residue which remains after digestion, and is, of course, only soluble in alcohol, to be a very excellent remedy for diarrhœa. He administered it in five cases of acute and chronic intestinal catarrh with very prompt effect. Dr. Picot, of Carlsruhe, writes that he tried the tincture of quebracho in three cases of dyspnœa, due respectively to catarrhal pneumonia, bronchial asthma, and valvular lesion, with very satisfactory effects. He also used it himself while doing some mountain-climbing in his vacation, and found that it enabled him to climb with much greater ease and comfort—for instance, a certain expedition caused the pulse to rise from sixty-four to ninety-four, and the respiration from sixteen to forty-two, with a very unpleasant sensation of shortness of breath, but after a dose of half an ounce of the tincture the same ascent only caused the pulse to rise to eighty and the respiration to thirty. A corpulent man and a nervous woman, who suffered greatly from dyspnœa after moderately rapid walking on level ground, were able to take the same amount of exertion without distress after a dose of from two and a half to four drachms of quebracho. (*The New York Medical Record*, April 10, 1880.)

On the Therapeutic Value of Massage.—Dr. Gerst has employed shampooing with good results in contusions and distortions of the limbs, in acute and chronic synoritis, in bruisings

of the muscular system, in subcutaneous extravasations of blood, in contractions and inflammations of the sheaths of tendons, as well as in dislocations, fractures, and in catarrhal affections of the mucous membrane of the nose, mouth, and larynx If the injury be complicated by abrasion of the skin or by wounds, Dr. Gerst adopts Lister's plan of employing measures of depletion. He also uses these measures in cases of recent fractures and dislocations, and endeavours to allay pain by accelerating the absorption of extravasations, increasing the rapidity of the circulation, and removing tension. In simple fractures, especially those of the radius in old people, which readily unite when put up in plaster of Paris, but leave behind them stiffness of the limb, the author discards entirely all bandages, and trusts solely to shampooing and wadded splints; the results proving that this method affords rapid and excellent cures. The treatment of catarrhal affections by the method of shampooing has also given excellent results in the hands of the author. His object is to lessen the inflammation of the affected mucous membrane by a systematic depletion of the superficial and deeply lying cervical veins and lymphatics by stroking the surface of the neck. Finally, this method of treatment has been employed in acute diseases of the ear, after concussion of the brain, and even in a case of fracture of the skull with a wound of the scalp, as the author believes with some result. (*Centralblatt f. Chirurgie*, April 10, 1880.)

Phosphaturia in Pulmonary Phthisis.—Dr. Stokvis, as the result of investigations which he has recently made in regard to this subject, finds: (1) That the elimination of phosphoric acid by the urine in cases of pulmonary phthisis is not characteristic either from a diagnostic or from a pathogenetic point of view. (2) This conclusion is justified by a series of analytical observations in which the following facts were established: (*a*) The total quantity of phosphoric acid eliminated by the kidneys in the course of twenty-four hours never underdoes any increase either at the commencement or towards the those of cases of phthisis. In comparing phthisis with other pulmonary affections it is indeed found that the amount of phosphoric acid thus eliminated is, if anything, diminished. (*b*) In certain cases of chronic phthisis in which there was scarcely any diarrhœa or rise of temperature, an increase in the earthy as opposed to the alkaline phosphates was noticed. Even in these cases, however, the earthy phosphates eliminated in the course of twenty-four hours reached a lower average than the mean for normal healthy urine, or for that fluid in other chronic maladies (phosphaturia, diabetes mellitus, and renal diseases). (*c*) The elimination of phosphoric acid in phthisis does not show any

constant deviation from the normal type in relation to the urea (as measuring the amount of nitrogen). This relative value of phosphoric acid is very rarely increased, but is more frequently normal or diminished. In some cases it may show a progressive decrease in the course of the disease. (*d*) The elimination of phosphoric acid in phthisis is always slightly increased in relation to the amount of chlorine in the urine, and occasionally this increase may be very marked. The increase is due simply to the diminished proportion of chlorine which is eliminated, and is more marked in proportion to the fever and digestive troubles, as would be *à priori* expected, since it has long been known that fever and inanition decrease the quantities of chlorine eliminated. (*e*) The normal relations between the quantities of sulphuric and phosphoric acids excreted by the urine does not appear to undergo any characteristic change ; in no case has any relative increase of phosphoric acid been observed, though on the other hand a marked decrease has been frequently noticed. The diminution appears to be always caused by an increase in the amount of sulphuric acid, which, like the diminished excretion of chlorine, is the constant result of prolonged fever and inanition. (3) The changes which the elimination of phosphoric acid by the urine in pulmonary phthisis undergoes can readily be explained by reference to changes in the physiological conditions by which the quantity of phosphoric acid in the urine is influenced. Such variations are not therefore due to specific morbid processes, but to a greater or less elevation of the temperature of the body, to more or less marked interference with the functions of digestion, to diet, and to disturbances of nutrition. (4) If the treatment of phthisis by phosphates and hypophosphites prove successful, the success must be attributed to the extra supply of phosphoric acid which is thus afforded to the organism for the purpose of making good those losses which it experiences through the kidneys (*Arch. génér. de Méd.*, June, 1880.)

The Propagation of Nervous Phenomena.—M. Rambosson read a paper before the French Academy of Medicine upon the propagation to a distance of certain affections and nervous phenomena, such as yawning, epileptic attacks, various nervous tics, panic terrors, &c.: he explained the propagation upon the hypothesis that the cerebral and psychic movements which gave rise to the phenomena were reproduced in the brain of the spectator through the intermediation of sonorous and luminous waves, and sustained his theory by reference to a number of facts. (*Le Progrès médical*, June 12, 1880.)

The Treatment of Diphtheria—Dr. Bernard adopts in cases of diphtheria a careful and energetic local and constitu-

tional treatment; he orders a nutritious and easily-digested diet with stimulants, the latter being well borne by children in large quantities in this affection. As medicines he prescribes benzoate of soda, sulphurous acid, chlorate of potash, and tincture of the perchloride of iron, and if the fever runs high quinine or the salicylate of soda. As local treatment frequent applications of antiseptics and solvents should be made to the diseased parts, carbolic acid being the best antiseptic, lime-water the best solvent. The inhalation of carbolised steam is also of great service in promoting the separation of membranes; after the membranes have separated the application of borax, glycerin, and carbolic acid are of use in restoring the mucous membrane to its normal state. If a false membrane is found in the larynx accompanied by slight laryngeal symptoms, all necessaries for the performance of tracheotomy should be at hand. Retraction of the soft parts during inspiration is a sure indication of the necessity of operative proceedings. (*The Dublin Journal of Med. Sci.*, May, 1880.)

On the Treatment of Rheumatism.—Dr. Thomas calls attention to a combination of salicylic acid which he has used many times with good results in both acute and subacute rheumatism, as well as in a few chronic cases of the disease. For this combination he claims the following advantages: that it does not disturb the digestive system; that it is very palatable; that it forms a perfect solution of salicylic acid; that it is effective in curing the disease; that it produces no bad effects upon the heart; and that it is less depressing than salicylate of soda. The formula is as follows:

℞ Potass. acetat. ℥ii.
Acid. salicyl. ℥ss.
Aq. menth. pip. ℥iv.
Syrup. limon. ℥ij. M.

It is best prepared by placing the potash and peppermint water in a porcelain mortar and gradually adding the acid, triturating to perfect solution, and then stirring in the syrup. The dose is a tablespoonful every two, three, or four hours, or oftener, according to the violence of the attack. This dose gives 20 grains of the acid to 80 grains of the acetate. In the robust class of patients without complications Dr. Thomas relies exclusively upon it, with an occasional hypodermic dose of $\frac{1}{60}$th to $\frac{1}{80}$th of a grain of atropia, or combined with morphia in cases where the atropia alone is insufficient to allay the pain; such patients are usually convalescent in five or six days. (*The American Practitioner*, May, 1880.)

Bright's Disease and Primary Cirrhosis of the Kidney.—The following conclusions are taken from a paper by Dr. Rosenstein of Leyden. (1) The anatomical lesions of the kidney which produce the whole of the clinical symptoms first described by Bright affect both the parenchyma and the connective tissue of the organ. (2) There is never a purely parenchymatous or a purely interstitial nephritis: it may be stated from clinical experience that in cases of really diffuse renal inflammation both histological elements are affected from the beginning. (3) The ultimate product of diffuse inflammation is the white or the red granular kidney, or from an anatomical standpoint the atrophied kidney, which differ in the fact that the parenchymatous affection is more marked in the former, and the interstitial in the latter. Clinically the one may be distinguished from the other by analysis of the urine. The symptoms of atrophy are, however, common to both forms. (4) Clinical observation also tends to show that the white kidney and the red granular kidney, or, as it is now called, primary cirrhosis of the kidney, is preceded by a period of tumefaction: nor do anatomico-pathological observations contradict this view. (5) The clinical description of Bright's disease applies entirely to the white granular kidney, in which the affection passes through two stages, both clinically and anatomically. (*Arch. gén. de Med.*, June, 1880.)

Carbonate of Ammonia in Diseases of the Respiratory System and in Heart Clot.—Dr. Thomas sums up the therapeutic value of carbonate of ammonia in the following propositions. (1) In every form of pneumonia it is the best single remedy; and is indicated in all cases in connection with any other additional treatment. (2) In the great majority of cases of croupous pneumonia (in connection with counter-irritation, when indicated by the amount of pain) aided by proper alimentation, it will abort the disease. (3) In all suffocative cases of the respiratory organs in children or adults, whether the result of acute capillary bronchitis or coincident with exanthemata, it is the remedy *par excellence.* (4) Judging from a limited trial of the drug in diphtheria, it appears to be superior to alcohol. (5) It is of value in croup, more especially in the suffocative stages of the simple disease. (6) In whooping cough carbonate of ammonia given with quinine aborts the affection. (7) It is a prophylactic in heart clot. (8) It will probably dissolve emboli after they are formed and deposited in the arterial or venous system. (*The Virginia Medical Monthly*, April, 1880.)

The Action of Benzoic Acid in Rheumatic Polyarthritis.—Professor Senator has previously called attention to the excellent results which follow the treatment of rheumatic

arthritis with benzoic acid He now brings forward a larger number of cases which confirm his original statements in regard to the action of this drug. In the earlier investigations, which were made in the beginning of the year 1877, the benzoic acid was employed not only in acute cases of rheumatic arthritis, but also in subacute cases without fever as well as in chronic ones; in the latter class, however, no results were obtained. Twenty-two cases out of a total of forty-six were treated solely by means of benzoic acid or sodium benzoate, which was given to the extent of 15 grams a day. The patients were relieved, in one case after two days of the treatment, in twenty cases after 3 7 days, and in one case, which was treated from the very commencement of the attack with small doses, after eleven days. No relapses or complications were observed in any case. In these cases it was clear that the favourable result was actually due to the benzoic acid, and this was further confirmed by the fact that in a second group of cases, four in number, the affection which had been futilely treated by salicylic acid, was really or apparently cured. In a third group, consisting of six cases, the author found that benzoic acid afforded no relief, whilst salicylic acid was of use. From these data, which are supplemented by fourteen cases in which salicylic and benzoic acids were both employed, Professor Senator concludes that benzoic acid exerts a distinctly favourable action in rheumatic polyarthritis, though it scarcely rivals salicylic acid. Benzoic acid possesses, however, the advantage that it may be given in very large doses The author therefore recommends that the remedy, or its sodium compounds, be used in those cases in which salicylic acid has failed, and that, if necessary, it be administered in large doses. (*Frerichs' and Leyden's Zeitsch. f. Klin. med.* 1, p. 243; *Centralb. f. d med. Wiss,* May 1, 1880.)

Bibliography.

De l'Alimentation des Dyspeptiques. Par. Prof. Dr. J. Wiel. Traduit de l'Allemand sur la 4 éd. par le Dr. R. Godet. 8vo. pp. 238. Karlsbad: Feller.

Die physiologische Regeneration d. Flimmer-Epithels der Trachea. Von Dr. Otto Drasch. 8vo. pp. 46. Wien: Gerold's Sohn.

Die Untersuchung der Frauenmilch f. die Bedürfnisse der ärztlichen Praxis. Von Dr. F. Conrad. 8vo. pp. 46. Bern: Dalp.

Ueber den Einfluss desinficirender Mittel auf die Blutgerinnung im lebenden Organismus. Von Ed. Hohnhorst. 8vo. pp. 35. Konigsberg: Hartung.

Die Messung des Pulses und des Blutdrucks am Menschen. Von Prof. Dr. L. Waldenburg. 8vo. pp. 255. Berlin: Hirschwald.

Taubstummheit u. Taubstummenbildung. Nach den vorhandenen Quellen sowie nach eigenen Beobachtungen u. Erfahrgn. vearb. von Dr. Arth. Hartmann. 8vo. pp. 212. Stuttgart: Enke.

General Paralysis of the Insane. By William Julius Mickle, M.D. 8vo. pp. 246. 10*s*. London: H. K. Lewis.

On the Educational Treatment of Incurably Deaf Children. By W. B. Dalby, F.R.C.S. 8vo. pp. 15. 6*d*. London: Churchill.

Practical Hints on the Preservation of the Teeth. By N. Stevenson, M.R.C.S., L.D.S. 12mo. pp. 16. 6*d*. London: Churchill.

Alcohol Tables. By Otto Helmer, F.C.S. Royal 8vo. pp. 21. 3*s*. 6*d*. London: Churchill.

*** Any of the foreign works may be procured on application to Messrs. Dulau, of Soho Square, W.C.; Williams and Norgate, of Henrietta Street, Covent Garden, W.C.; or Baillière, of King William Street, Charing Cross

THE REPORT OF THE IMPERIAL GERMAN MEDICAL COMMISSION ON THE PLAGUE WHICH PREVAILED IN THE PROVINCE OF ASTRAKHAN DURING THE WINTER OF 1878 AND 1879.

BY J. LAWRENCE-HAMILTON, L.R.C.P., ED., &c.

(*Concluded from* p. 155.)

THE official lists of the sick and dead as reported by the Astrakhan doctors were kept in such a slovenly, irregular way as to become practically worthless. Thus, from a heap of errors, in a report signed by two of the local doctors, among other blunders, three people were returned as having died of "pneumonic croup" who were afterwards seen to be alive and well by the German Commissioners. The European experts found, among eighty-one convalescents from the recent plague, fifty-one persons quite free from scars of buboes or glandular swellings, eleven scarred with healed buboes, in eighteen the remains of glandular swellings not yet dispersed, and in one case an ulcerated bubo.

Of the eleven presenting scars of buboes, five of the scars were situated among the crural glands, three among the inguinal glands, two were situated under the jaw, and one was located in the armpit—an order of occurrence, by the way, which agrees with that given by Griesinger.

The buboes are reported often to have attained to the size of a wallnut, and to have been generally solitary. It was most exceptional to find both sides of the body thus affected; it was still rarer to see two buboes in different regions of the same

patient. Buboes, when opened, either by art or by nature, were found to afford great relief to the patient. From the third to the sixth day or later was the usual time for the bubo to mature. Convalescence was generally ushered in and indicated by profuse sweating. There appears to have been a bare possibility that the plague may have been preceded by lung complications.

The Vetlianka epidemic began with the severest form, terminating generally in death within forty-eight hours. The minimum period of incubation would seem to have been two days and a half, and the maximum eight days.[1] The average period of latency of the disease was 5·2 days, though in acute cases a shorter interval sufficed.

According to the views of some, plague in Astrakhan was derived from the Persian town or neighbourhood of Resht, which is but a few miles from the southern border of the Caspian Sea. In this city it will be remembered that plague raged virulently from November 1876 till October 1877. Now it happened that in the summer of 1877 the town of Astrakhan

[1] The following table is given relating to the period of incubation :—

FROM STARITZKOIE.

	Incubation Period in Days. Minimum.	Maximum.
In 1st case	2	3
,, 2nd ,,	1	3
,, 3rd ,,	4	6
,, 4th ,,	5	7

FROM PRISCHIB.

	Minimum.	Maximum.
In 5th case	2	?
,, 6th ,,	3	9
,, 7th ,,	3	9
,, 8th ,,	3	9
,, 9th ,,	3	9
,, 10th ,,	2	14
,, 11th ,,	1	15
,, 12th ,,	1	15
,, 13th ,,	4	?
,, 14th ,,	4	?
,, 15th ,,	?	4
,, 16th ,,	4	?
,, 17th ,,	1	8
,, 18th ,,	1	5
,, 19th ,,	2	7
,, 20th ,,	2	7

and its vicinity were afflicted with a malady, which may possibly have been a mild form of the disease.

The malady in question is described as being complicated with various glandular swellings in the axillary, submaxillary, inguinal, and crural regions Long protracted fever was present. The swellings seldom attained to a large size, and terminated as a rule in resolution. Only one case proved fatal, pyæmia being stated as the cause of death. In the town of Astrakhan probably some 100 to 150 persons were attacked by this disease. The garrison of the city was not attacked by it, and only one instance of contagion occurred among the nurses and attendants upon these sick persons in the summer epidemic of 1877.

The clothes of all who fell sick in 1877 were disinfected by the authorities in the hospitals of Astrakhan.

As has been previously observed in plague, both in Persia and in Mesopotamia, there happened some time before and again some time after the appearance of the severer forms of the disease, a series of milder cases which, so to speak, ushered in and ushered out the severest variety, or *pestis siderans.*

According to Dr. Hirsch the first undoubted case of plague in Vetlianka was that of the woman Mawra Pisarewa, who went by boat from Vetlianka to Astrakhan *viâ* Vorpost, which faces Astrakhan on the opposite side of the river Volga. She visited a sick relation, a Russian Cossack soldier, who had just returned from the war in Armenia. It will be recollected that between Armenia and Mesopotamia communications were continual and uncontrolled. Dr. Hirsch thinks that in spite of official contradiction there is every reason to believe that the plague had visited both the armies of the Turks and the Russians in Armenia.

Even if the Cossack soldiers were themselves free from the plague, it is still possible that their clothes or effects may have at the seat of the war become plague-infected. Many are of the opinion that plague-infected effects, including the booty and pillage of war, may long retain the poison, especially if the effects be packed up in tightly-closed boxes. Such packages, even after a long time, on being reopened would be likely to give forth the poison of plague-contagion. Dr. Sommerbrodt, one of the German Commissioners, relates two cases of plague distinctly

traceable, in the opinion of the Commissioners, to infection from clothes.

The investigations relative to the weather, the nature of the soil, and the sanitary conditions of the dwellings, threw no light upon the question as to whether such exterior causes influence the course and character of the plague.

The German Commission openly declare that had the Russian Government been served by a medical staff of higher class than then existed in Astrakhan, the plague at Vetlianka would have been much less intense; and they further abserve that the Russian executive fails to obtain from Astrakhan either reliable or early information and advice upon sanitary and medical matters.

The Central Russian Government, after receiving news of the outbreak, first sent out Dr. Koch to Astrakhan. He was presently seized with plague and carried off by the disease on the 15th[1] of December. Next Dr. Morosow was sent, who, on the 28th of December, fell also a victim. Dr. Grigoriew followed, and became, on the 8th of January, the third medical victim. Lastly, Dr. Krassowski was sent, but when he arrived at Vetlianka plague had almost disappeared.

In Vetlianka, until the 18th of December no precautionary sanitary measures were taken. The inhabitants acted upon their own opinions, unaided and undirected by any experienced or recognised expert.

During the panic it was found impossible to get the plague-corpses buried, hence the bodies remained uninterred till the termination of the epidemic Even then the dead were only thrown into pits and loosely covered up with earth to the extent of about a foot. Later, over these first interments some lime was thrown and made firm by the addition of a layer of clay, the ground being raised to about the height of three feet above the corpses. It was still later before the pest-stricken houses were cleansed and disinfected.

Count Loris Melikof arrived towards the end of January, and issued a proclamation on the 2nd of February for the cleansing and scavenging of all streets in the towns and villages of the province. The burial-places were also inspected and their

[1] The dates are given in Old Style.

condition improved. The sale of food was watched over by a sanitary executive. Means of disinfection were kept in readiness so as to be used when required.

For forty-two days after the last death from plague a strict sanitary cordon around the infected district was maintained. Fixed or permanent stations were established at intervals of every two miles and maintained by Cossack soldiers. Between these stations were patrols. It was given out by the Russian authorities that during the night extra intermediate patrols were placed. On both banks of the river Volga the cordon was enforced. During the period when the stream was frozen over, quarantine was carried out on the Volga by guard-posts on the ice, and later by guard-boats. Cordons were also established around the infected villages. Some of the special cordons were abolished on the 15th of March, whilst the general cordons were not removed till the end of April, 1879.

Quarantine lasted at Samiani from the middle of January till the end of April, 1879; at Sietlojar from the 29th of December, 1878, till the 15th of March, 1879; at Sarepta[1] from the 27th of December, 1878, till the end of March, 1879. Here, as throughout this report, the dates are given in the Old Style.

The quarantine arrangements observed during the Commissioners' tour of inspection are thus described:—

A. A reception-house for examining and disinfecting papers and passports.

B. At a distance of some fifty yards from A were two buildings to accommodate persons suspected of being infected by the plague.

C. An establishment for disinfecting clothes.

D. The lazaret or infirmary for plague patients.

E. The lazaret for those suffering from suspicious or contagious diseases.

F. The lazaret for those thought to have non-suspicious and non-contagious diseases.

[1] Sarepta is a fortified town on the river Sarpa near its influx into the Volga, fifteen miles south of Tzaritzin. Its population is given by Keith-Johnston as 4,500. It is the centre of numerous colonies of Moravians. It has a custom house, schools, and manufactures of cottons, silks, woollens, hosiery and tobacco.

J. L. H.

Now A, the reception-house for examining papers and passports, was isolated by a hedge. In it were stationed the local army-surgeon, a police official, and some Cossacks. The doctor with a pair of tongs took up the passport into the disinfecting chamber containing a well-closed wooden box or case having within it over a sand-bath a saucer holding a mixture of 3 parts of superoxide of manganese, 7½ parts of sulphuric acid, and 6 parts of chloride of sodium. The process of each disinfection was continued for an hour.

B. The two buildings destined to receive those who were suspected of plague were separated from each other by a space of two yards. The one building comprised a large common room for the admission of ordinary people, such as peasants and the like. The other building consisted of four small rooms and was set apart for the service of people of distinction.

Native tents were kept in readiness to meet the exigency of any sudden increase of plague-suspected guests.

Outside these buildings a watch was kept by two attendants, termed the overseer and the guardian, and who wore suits consisting entirely of leather. The overseer through the opened window was presumed to watch the condition of a patient. The guardian brought the food in to an ante-room, and, on his retiring, then the quarantined individual was allowed to carry into the inner apartment his own meal. Afterwards the guardian was required to remove, with a pair of tongs, the vessels and appliances used in eating to the disinfecting room.

C. The building for the disinfection of clothes numbered two rooms, in one of which linen and other washable clothes were soaked for two hours in a solution of chloride of lime; whilst the unwashable clothing underwent disinfection in the same manner as described for the papers and passports.

The servants who attended to this department, and waited on those suspected to be plague-infected, wore leather suits covered with tar.

The washable linen and clothing belonging to those suspected of being plague-infected underwent twelve hours' disinfection, with forty-eight hours' subsequent airing. When, however, it was discovered that the washable clothes came positively from plague-stricken individuals, then the process of disinfection was

repeated and continued twelve hours; with forty-eight hours subsequent airing, *plus* twelve hours further disinfection, and then the clothes were burnt!

In connection with the department for disinfecting clothes, there was a large open space to receive carriages and animals, in order that they might be subjected to quarantine.

The Russian executive does not look upon fish as being a cause of spreading the plague; but the places where the unloading of fish from the carts took place underwent disinfection with chloride of lime. The fish was then packed in other vehicles, or possibly in the same vehicles after these had been cleansed and disinfected. (?)

In Samiani the extra reserve tents were those of a Russian military ambulance, being very similar in character to the tents used in the Russian army.

All effects, clothing, paper, and copper money had to undergo twenty-four hours disinfection. Carriages were covered over with stretched-out tarred sail-cloth, and then well smoked and disinfected under a capacious tent.

In Samiani the disinfecting mixture was composed of 6 parts of manganese, 9 parts of common cooking-salt, 7½ parts of concentrated sulphuric acid, and 7½ parts of tepid water.

Immediately after the removal of the cordon at Vetlianka, the civil and military authorities, after having valued the plague-visited houses, and the suspected plague-infected effects, burnt all these properties.

The Russian Government paid for burning houses and goods 69,000 roubles—(a silver rouble is equal to 3*s.* 2*d.* in English money)—of which 50,000 was compensation for eighty-three houses, and 5,000 roubles for the work of pulling down the buildings. 14,000 roubles were set aside as compensation for the destruction of clothes.

A number of medical men, under the presidency of the military surgeon, Dr. Reutlinger, were stationed for some time in the infected locality after the cessation of the outbreak to supervise the measures of precaution adopted against any recurrence. The cordons were very strictly kept; but the German Commissioners were not informed, as had been reported, that persons trying to break through the cordon were shot by the executive.

The quarantine arrangements appear, however, to have been very primitive, and the stations were too small for the number of persons requiring admittance. They were, moreover, too near together. The quarantine laws, indeed, could not be rigorously enforced; and the internal arrangement of the quarantine stations is stated to have been so defective that many of the healthy inmates became victims to the epidemic.

The conclusions of the German Medical Commissioners are thus summed up:—

(1) Between the commencement of October, 1878, and the close of January, 1879, a malignant disease prevailed in the province of Astrakhan, visiting six districts, in one of which only an epidemic diffusion took place. In all, from 450 to 500 deaths occurred.

(2) The disease presented the distinctive characters of oriental plague.

(3) The origin of this attack of the plague is uncertain. Plague is not indigenous to the province of Astrakhan; and it cannot be clearly proved that the disease was imported from Reslit, in Persia during the year 1877.

It would seem most probable that the outburst was due to importation of plague-infected articles from the Asiatic seat of the Russo-Turkish war.

This epidemic affords a further illustration of the difficulty, even after careful investigations, of discovering the direct origin of the plague.

(4) Owing to the imperfect and faulty reports of the nature of the disease in Vetlianka, the Russian Government could not avail itself of preventative or precautionary measures until the outburst of plague had attained its maximum intensity, and was already approaching towards its natural termination. Even then the Russian executive were only prevailed upon to take up the matter *after* foreign nations and neighbouring powers had stopped their traffic with this part of the Czar's dominions, and *after* foreign scientific experts had been despatched by foreign powers to investigate the disease.

THE POTATO DISEASE, AND THE DISTRESS IN IRELAND.

As the facts connected with the recent, and still existing, distress in Ireland become more clearly known, it is obvious how closely, in all their essential features, they correspond with those of previous periods of distress. A similar failure in a staple article of diet of large masses of the peasantry; like consequences of a protracted deficiency of food and of the pathological accompaniments thereof, as witnessed in typhus, relapsing fever, dysentery, diarrhœa, and the numberless unnamed evils attending chronic starvation. Of deaths from actual starvation there would appear to have been few; scurvy would not seem as yet to have shown itself, and neither typhus, nor relapsing fever, nor dysentery have manifested themselves in the pestilential forms which characterised their prevalence in the terrible distress of 1846-47. But, except as to the intensity of the evils, both social and pathological, and freedom from horrors which still oppress the memory like a nightmare, the present period of distress differs in no essential particular from the previous period just referred to in its origin and progress. Like the distress of 1846-47 (and other periods of distress preceding that) it had its origin in the failure of the potato crop, and it has again forced upon the attention of the Legislature and the public the terrible risks run by those sections of the nation who have to depend for their food mainly, if not wholly, upon a single sort of crop, precarious from the diseases to which it is liable.

The time has not yet come when the history, pathological and other, of the distress of 1879-80, can yet be written, but the fundamental condition of the distress, the failure of the potato crop, admits of being considered, and it has been made the subject of consideration of a Select Committee of the House of Commons appointed to inquire into the best means of diminishing the frequency and the extent of failures of this crop. The Committee examined a number of witnesses, and among others several distinguished scientific men who gave evidence as to the

nature of the disease which had destroyed the potato crop and which, since the great potato *blight* of 1846-47, has proved so destructive to the growth of the potato in the United Kingdom and Ireland. The extent of the recent destruction of the crop in Ireland may be estimated from the following figures quoted from a report recently presented by Dr. Sigerson to the Mansion House (Dublin) Relief Committee. The produce of the potato crop in the three years, 1874-76, is thus stated:

1874 . . .	3,551,601	
1875 . .	3,512,884	11,219,270.
1876 . .	4,154,785	

During the three following years the produce was as follows:

1877 . . .	1,757,275	
1878 . . .	2,526,504	5,397,455.
1879 . . .	1,113,676	

Having regard to the extremely important part which the potato crop plays in the health history of Ireland, and to the general importance of the tuber as an article of food throughout the country, it can scarcely fail to be of interest and use to describe, from the pages of the Blue Book containing the report of the Select Committee, the evidence of the principal scientific witnesses on the nature of the disease to which failure of the crop is to be attributed. This we propose to do, giving in abstract for the purpose the evidence of Mr. W. T. Thiselton Dyer, M.A., F.R.S., Assistant Director of the Royal Gardens at Kew, Mr. W. Carruthers, F.R.S., Head of the Botanical Department of the British Museum, and Mr. Worthington Smith, F.R.S., F.L.S.

Mr. Thiselton Dyer said:—

The potato disease, I think, is now generally acknowledged to be the result of the depredations of a fungus upon the potato plant. Putting scientific technicalities aside it will be perhaps sufficient to describe the potato fungus as what is ordinarily called a mould. It is somewhat similar to the moulds with which every one is familiar which attack decaying organic substances, especially when exposed to damp; but it differs from such moulds in attacking in this particular case a living plant, and by the breaking down of the tissues of the living potato plant which the fungus effects in its growth, it inflicts upon it those mortal injuries which destroy its life. That, I think, is, in a general way, the best manner of stating what is the relation of the fungus to the plant upon which it feeds. It is rather difficult to select a point at which to commence what one may call the biography of this potato fungus. Perhaps it would be

best to commence with the period at which it attracts the attention of the farmers in practical agriculture. This, I believe, usually occurs in the autumn or in the late summer, especially when the autumn or late summer has been characterised by periods of warm rain. It is not necessarily the case that the appearance of the potato fungus should be limited to that period of the year, but I believe, as a matter of fact, in the majority of cases, where it has been a serious cause of loss to the farmer, that that has practically happened. What is first observed is that the foliage of the potato plant exhibits a certain yellowish tinge, which in all plants is regarded as a symptom of ill-health, and this yellow tinge is aggravated in places by the appearance of discoloured spots When those discoloured spots are examined, and the leaf is lifted up, on its under side there is generally to be observed a white flocculence. When some of this white flocculence is examined by the aid of the microscope, the flocculi are found to consist of branched filaments, and those branched filaments have peculiarities of structure which have been very carefully studied, the best work on the subject having been that of Professor De Bary of the University of Strasburg. The branches of these filaments have a peculiar knotted structure, which is highly characteristic of the fungus, and which is due to the peculiar mode in which certain ovoid bodies are developed from the branches. The end of the branch develops one of those ovoid bodies, and when that is matured the ovoid body is turned aside, usually falls off, and the end of the branch goes on growing and produces another. That is a condition of things which is highly characteristic of the potato fungus in a scientific point of view. The contents of the ovoid body break up into a number of portions, varying from three to eight, and these are constituted of that substance which is practically familiar to every one now, and which scientific men call protoplasm. After a time the ovoid body ruptures, especially if the atmosphere is in a damp condition; no doubt the case of the ovoid body absorbs moisture, and that promotes its disruption by the augmentation of the internal pressure. However that may be, the contents come out, and each is then seen to be furnished with two whip-lash filaments, which are also protoplasmic, and which are capable of moving backwards and forwards with very considerable vibratile velocity. The result is that if the leaves of the potato of the plant are bedewed with rain, or with the night dew, these bodies are capable of moving about in the film of moisture upon the foliage, and there can be little doubt that by the concussion of one potato plant with another, by the mere action of the wind, the films of moisture are placed in contact, and so one centre of infection is capable in an ever-widening circle of infecting the whole field. When these zoospores, as they are called, have been dispersed in that way, after a time they come to rest, they lose their whip-lash filaments, and they then eventually germinate. This process of germination consists in the protrusion from their substance of a small process which punctures the tissues of the potato plant, feeds upon them, takes nutriment from them, and then extends through the tissues of the potato plant by continued growth and branching a number of filaments which break down the continuity of the tissues and produce decay and death in every part that they traverse; so producing the well known effects which a field of diseased potatoes exhibits. That is the rough outline of what happens when an outbreak of potato disease takes place. Of course, the scientific history of this subject, and the economic importance of the matter, is not exhausted by that statement. There appears no reason to believe (and I say this, of course, subject to correction) that these ovoid bodies have more than a temporary existence; it is not, I believe, accepted that they are able to pass over a winter and so to be a source of infection by being

dispersed in the soil, or in any matters connected with agriculture, so as to serve as the seeds of the fungus in the following season. I should just add to what I have said about these ovoid bodies (it is a matter of no very great importance, but it makes the statement that I have given more complete), that occasionally the contents do not divide; and in that case the whole ovoid body is susceptible of germinating or of throwing out a filament from it very much in the same way as an individual segment is. The question then arises in what mode is the continuity of the disease provided for by nature; in what way is the process of hybernation accomplished; how is the disease carried over from one year to another, and that, of course, is an economic problem which is of great importance, because if we could wipe out the disease after it has done its worst in one year, we should of course, be able to start afresh in another year, and the potato disease might in that way disappear from agriculture. There is apparently no reason to suppose that these ovoid bodies, the history of which I have described, have more than a temporary function to serve; but they are the undoubted mode in which the fungus is dispersed during the season of its appearance, whether by mechanical means or by currents of air, and as its growth and multiplication proceed with extreme rapidity, as soon as these ovoid bodies have been dispersed and discharged their contents, they soon give rise to a new crop of spores, and so on, *ad infinitum*. The rapidity with which a field is attacked from perhaps only one centre is a matter which need not be wondered at, because the infection is carried on with very great speed indeed. Now, there are two points from which what is called the hybernation of the disease has been regarded. Fungi of this description are very well known to scientific men. There are many species very closely allied to that which attacks the potato plants, which are common on many of our British weeds; and it is a remarkable thing that the biography of some of these unimportant species is much better and more accurately ascertained than that of this serious one which we are now considering. In the case of some less important species allied to the fungus of the potato disease, there is another kind of reproductive body which is occasionally met with. Such a body I may state is called a resting spore, and it is produced by what is essentially a sexual process; that is to say, two parts of a filament of the potato fungus contribute towards its formation, one being the receptive organ, which outlines or forms the spore, and the other supplying the fertilising influence which is necessary to its future vitality. The body so formed is called a resting spore, and it differs from the ovoid bodies I have described in not being adapted to a mere transitory purpose, but having considerable powers of dormant vitality, having considerable powers, in fact, of existing through the winter, so that in the case of some of the resting spores of certain other species they are found in the soil, and can occasionally actually be detected there, and there is no doubt that just like the seeds of weeds, they fall into the ground, lie dormant during the winter, and then when the warm wet weather comes are ready to spring into vitality. Theoretical considerations would lead one to suppose that such a resting spore would be detected in the case of the potato fungus, and the scientific men of Europe, of this country and elsewhere, have had their attention very anxiously directed towards that point. It is a point to which Mr. Carruthers has paid more practical attention than I have, and we may or may not agree with what seems to me to be the balance of evidence upon this matter. Mr. Worthington Smith believed that he had found such bodies, and it is by no means certain that his discovery is not a genuine one. The evidence is not absolutely conclusive, although it affords a high degree of probability. But I think it may be stated with some degree of certainty that whether these resting spores

exist in the case of potato fungus or no they are comparatively rare bodies, and it is not by means of them (of course I say this entirely on my own responsibility), that I think the potato fungus is perpetuated from year to year, at any rate, in the vast majority of cases. I have read the researches which have been made by several persons, and which have been most carefully conducted by Professor De Bary, whose name I have already mentioned, and who is the greatest living authority for this group of plants. His observations convey to my mind a very strong feeling of probability that the mode in which this potato fungus is carried on from one year to another is by means of filaments of the fungus, which apparently pass into a dormant condition in the tubers in the seed potato. After the fungus has attacked the foliage in the way I have described, there is little doubt that as all the succulent tissues of the potato are susceptible of giving it nourishment, it not only devastates the foliage, but finds its way down the haulm or the stems of the potato plant, to the tubers, these being only a modification of the haulm, and in direct communication with it. I have little doubt, in fact, that the potato disease is perpetuated by the mycelium, as it is called, that is to say, by the filaments of which the potato fungus is made up.

Mr William Carruthers said:—

In regard to the account which Mr. Dyer has given of the fungus causing the potato disease, I entirely agree with him. There is no difference of opinion. This is not a theory which is held by scientific men, but the result of observation of facts, and there can be no difference of opinion at all as to the plant being the cause of the disease, and the whole story of the plant, which Mr. Dyer has put, is precisely what is accepted as the life-history of this plant. I do not know that I have anything to supplement to that. Of course it is necessary to make it somewhat popular here, and I think Mr. Dyer has given a very satisfactory account of the life-history of this plant. I differ however from him with regard to the origin of this disease, and if you will allow me I will put it to you somewhat historically. The disease, I believe, did not exist at all in Europe before 1844. In that I entirely differ from Mr. Dyer. Many diseases had been observed; many injuries to potatoes had been observed and carefully described before 1844, but this particular disease had not. It is due to a species of plant, and although that species is small it is as easily separated from allied plants as species of flowering plants can be separated from each other. This plant was known in South America before it made its appearance in this country. It has been traced from South America to North America and to Australia, and it made its first appearance in Europe in Belgium in 1844, and within a very few days after it appeared in Belgium it was noticed in the Isle of Wight, and then within almost a few hours after that it spread over the whole of the South of England and over Scotland. What is of very great importance for us to consider is that this was not at all due to the presence of diseased tubers. The disease first made its appearance in Britain from some cause entirely outside diseased tubers, because in the planting of the crop of 1844 no diseased tubers were planted. I believe that the spread of the disease each year is due entirely to the same cause as its spread when it made its first appearance. The great difficulty in regard to the disease is what Mr. Dyer has again and again expressed, the method of its being carried over from one year to another. The appearance of the disease in the autumn, I believe, can be very easily explained. Mr. Dyer has shown that when the disease begins to make its appearance the fungus produces large oblong bodies,

(*conidia*), and the question is how these bodies are spread and the disease scattered. Now I differ from Mr. Dyer in this: I believe that these bodies which are produced in immense quantities, and very speedily, within a few hours after the disease attacks the potato, are floated in the atmosphere, and are easily transplanted by the wind all over the country. I believe this is the explanation of the spread of the disease in 1844, when it made its appearance in Belgium. The spores produced in myriads, were brought over in the wind, and first attacked the potato crops in the Isle of Wight, and then spread over the South of England. The course of the disease is clearly traced from the South of England towards the Midland Counties, and all over the island and into Scotland and Ireland. It was a progress northwards. Then the story of their growth is very simple. This plant, the *Peronospora infestans*, will only grow on the particular plant, the *Solanum tuberosum*, that is, the cultivated potato. As Mr. Dyer has said, it has been noticed on some other plants, but it does not take kindly to those plants. It grows on this particular species, and just as plants of higher organisation choose their soils, some growing in the water and some on land, so this particular plant chooses its host plant; and its soil is this species *Solanum tuberosum*. It will not grow if it falls on the leaves of the beech or the oak, or on grass, because that is not its soil, so to speak. Now the process of growth is simply this: when this compound body falls on the leaf it will remain there perfectly innocent and harmless unless it gets a supply of moisture to enable it to germinate; just as wheat lies in the granary from year to year, and does not germinate unless it gets moisture. The belief which was expressed by a Member of this Committee that it was due to electric or other conditions, is very easily explained. The disease makes its appearance in the end of July or the beginning of August, when we have generally very hot weather. The temperature of the atmosphere is very high, and we have heavy showers of rain. Those showers of rain are generally due to electric disturbances; that is to say, are thunder showers; and the atmosphere, which is able in its hot state to take a large quantity of moisture into its composition without being seen, at night when the temperature decreases slightly by the disappearance of the sun, and the atmosphere loses some of its heat, then the moisture which was present, though imperceptible in the composition of the atmosphere, gets liberated, and appears as a fog or mist, and this fog or mist supplies this compound body with sufficient moisture to disrupt it. The contents (zoospores) are liberated, and move about in the moisture for a little time till their tails disappear, and then they begin to germinate; they throw out a small root, which is able either to pass in through the breathing pores of the potato, or to penetrate the skin of the potato, and as soon as it has got through the skin of the potato it pushes itself into the living tissues of the plant. It gets sufficient food there, and spreads freely all through the plant. The first appearance is the brown discoloured spot; then this brown spot sends out from the under surface a quantity of flocculent branches having the appearance to the naked eye of an ordinary mould, and when that disappears the spot becomes black, but the mycelium pushes its way centrifugally from the point of attack, and the mould spreads with the spread of the mycelium in the leaf, and you get a border of mould round the black spot, which gradually increases till it covers the whole of the leaf, and the leaf is destroyed. In the meantime the mycelium has been pushing its way down the stalk of the leaf, and down the stalk of the potato into the tubers in the ground; this, I believe, is the ordinary and normal spread of the disease, and it is not due to atmospheric conditions, except that it is necessary that there should be a supply of moisture outside the potato to enable the com-

pound body to break up, and the little seeds to germinate; then when they take possession of the potato plant it is impossible to stop the disease, and when once it has taken possession of a single plant of potato, the compound bodies at the ends of the branches are produced in such abundance that clouds of them are scattered through the air, and are ready to attack not only the plants in that field, but the whole of the plants of the country. you cannot possibly stop it. I believe this is the story of the introduction of the disease in 1844 into England, Scotland, and Ireland, and is the story of the introduction of the disease every autumn. Of course the difficulty with regard to the disease is how it is carried over the winter; and if I may be allowed perhaps somewhat to repeat what Mr Dyer has said, I would put it in this way, that it is possible that the plan which Mr. Dyer believes to be the main method, is one of the methods by which the disease is carried over; that is, it is carried over in diseased tubers which are planted; but if there is any reason to believe that Mr Smith has found the resting spores, and I think there is some reason to believe that, then these resting spores are more probably the means of carrying the disease over. The resting spores are very different from the spores previously described. They have a very much indurated coat, which permits their preservation even in the most unfavourable conditions throughout the winter, and I believe that these resting spores are produced in the solid substance of the potato; they are in the leaf, the haulm, or the tuber, and are able to resist the decay which takes place in the leaf, the haulm, and the tuber; and they are carried over in this decaying matter through the winter, and are ready to operate when the season comes round for their germination. I do not believe that any amount of decay, even on the dungheap, would destroy these resting spores, if they are really the resting spores of the *Peronospora* that have been discovered. I have always recommended that the haulms of diseased crops should invariably be burnt in the autumn when the potatoes are lifted, and should never, under any consideration, be put on the dungheap. I believe that that is a most dangerous method of spreading the disease, and probably is the method by which the disease is spread. But then Mr. Dyer also referred to the fact, that the lower fungi do not always pass the whole of their existence on the same kind of plant, and that this is a matter which has never been fully investigated. Mr. Jenkins, the Secretary of the Royal Agricultural Society, drew special attention to information which he had received from farmers, that potatoes following clover had on some occasions been singularly free from the potato disease; but I must say that my own observations, when I carefully attended to this matter, did not substantiate that opinion. I have not been able to see any foundation whatever for supposing that any of our cultivated crops are the means of carrying over this fungus in another stage of its life. I believe that the disease is spread by these oblong bodies (*conidia*), and only through the leaves, and that this being so, I am not aware of any experiments, and I myself have failed in any experiments I have made to trace the progress of the disease from a planted tuber. I believe, however, the tubers may be the means of producing disease in this way. We know quite well that when potatoes are stored up in pits the disease increases in the tubers, and that the fungus grows in the pit, and I have no doubt this is due to the increased temperature which always takes place in pits, especially in connection with decaying matter. There is generally some straw put with them to keep them separate from each other. The haulms used to be put in in my younger days before the disease had appeared, and whenever this decaying matter is present a certain amount of decomposition, as in a dung-heap, takes place. Under these circumstances the disease spreads in the tuber, and the resting spores would be freely produced in

the tuber, so that you would have a condition eminently fitted for the production of these resting spores, and for the spreading of the disease.

On the spread of the disease Mr Carruthers further said:—

My belief is, that if a diseased plant were growing in the Isle of Wight the likelihood is that the whole of the crop throughout the three kingdoms would be, not destroyed but affected by it; that you could not possibly save it, and this is the case in other similar diseases If you have a condition fit for the growth of mould of cheese or any decaying matter, you will find spores present in the atmosphere ready to take advantage of this condition of things, and the mould will at once make its appearance, and so it is with this mould of the potato.

And in answer to the question:—

Then do you think it is of much importance whether there is a large stock of diseased potatoes left over from the winter, or only a very small stock left in the kingdom. Do you think a few potatoes will be equally capable of affecting it in the same time?

Mr. Carruthers added:—

I think the few potatoes will do it if the disease appears. Our difficulty at present is where the disease does appear, how is the disease carried over the winter? Granting the appearance of the disease in a field of potatoes in a county or country, you cannot stop its progress after the disease has appeared, but we do not know how it appears. That is the question the Royal Agricultural Society and botanists have been facing for years. They want to discover how it is that the disease in the first instance appears. Mr. Dyer has given you one explanation. It is not satisfactory to me. It may be the right explanation, but I am not satisfied at all that it is the right explanation; and what I do not see any light on at present is, how this disease at first appears; does it come from these resting spores; does it come from other plants upon which this *Peronospora* lives in some forms not yet detected as belonging to it? Where does it come from? We do not know.

Mr. Worthington G. Smith said:—

The nature of the fungus first in order of the potato-disease, *Peronospora infestans*, a fungus which invariably accompanies the murrain,[1] has probably been fully described to the present Committee; first by Mr. Dyer, of Kew, and next by Mr. Carruthers, of the British Museum; so that it is unnecessary for me to refer to it again in detail. A fact unaccountably lost sight of by many botanists is, that there is a second fungus parasite upon the potato plant, second in order with the *Peronospora*, and almost equally virulent with it. This second fungus is named *Fusisporium solani*, it commonly grows in company with the first upon potatoes. Like the first, too, it disorganises by contact, and it is almost, if not quite, as powerful in causing the utter destruction of the potato crop as the *Peronospora* itself. Both these fungi go to rest in an egg condition;

---

[1] Mr. Smith was questioned about this novel application of the term *murrain*, usually limited to epizootics, to an epiphytic. He said he had no particular reason for applying the term to the potato disease, but as murrain meant "a bad, infectious, and fatal disease generally; often a blood-poisoning disease among animals," he had adopted it as indicating parallel phenomena among plants.

the eggs, or 'resting spores,' as they have been termed, of *Peronospora,* are capable of remaining in a hybernating state in the ground for a period of from one to three years before they show any signs of renewed life; whilst the resting spores of the *Fusisporium* seldom hybernate for a period longer than from three months to one year. It is a very easy matter to destroy the fruiting branches of both fungi whilst in a growing state, but the resting spores are able to resist climatic extremes of moisture, dryness, frost, and heat. The resting spores of both these fungi continue to hybernate whilst climatic conditions remain unfavourable to their active growth; but on the advent of a favourable amount of humidity and warmth they start into renewed life, and in the first instance grow on any material at hand provided it is not caustic or corrosive. Microscopic fungi are commonly prepared for prolonged examination in glycerine, and nothing is more common than to see the spores of the potato fungus (and the spores belonging to many other fungi) growing in glycerine. The sudden onslaught then of the potato-murrain each successive autumn is caused by the advent of exactly sufficient warmth and humidity to suit the germination of the resting spores. The resting spores or eggs of both the *Peronospora* and the *Fusisporium* rest on and in the ground everywhere, especially in damp places and among decaying vegetable refuse. When these eggs at length burst they generally protrude threads which carry seeds or spores, and these seeds are set free in uncountable millions. These seeds sail through the air, and such as fall upon potato plants rapidly gain an entrance to the interior tissues of the host and cause its corrosion and destruction. No doubt living resting spores together with fungus spawn are often planted with potatoes, and when this is the case, the disease commences with the tuber and works upwards, whilst in the former case, *i.e.,* when the germination of the resting spores takes place upon the neighbouring ground, the leaves are the first parts attacked from the air, and the disease works downwards to the tuber. Diseased potatoes when planted often produce perfectly sound crops, for it by no means follows as a rule that because a potato is merely discoloured and 'diseased' as potato growers say, that it must invariably carry within itself healthy hybernating spawn or hybernating spores, or seeds of the murrain capable of reproducing the disease. When potatoes once have the murrain decidedly upon them, cure is perfectly hopeless; the potato plant is permeated by a poison hostile to and potent against its life, and no treatment can possibly renew the corroded and putrescent tissues of the potato plant. The position of the potato in a case like this is equally hopeless with that of a human subject under the last stage of blood-poisoning or consumption. The above being my opinion of the hopelessness of cure, I will concisely confine my remarks to the answering of two main questions, viz.:—1st. Why does the potato plant fall such an easy prey to the murrain? 2nd. Is it possible to prevent or palliate the destructive virulence of each annual assault of the fungus?—Why does the potato plant fall such an easy prey to the murrain? My answer to this is, that although there are many well-known instances of bad attacks of the murrain falling upon well-cultivated crops, yet as a rule (and taking an average of the general mode of culture throughout the country) potatoes are badly stored, badly planted, badly cared for, and, as a rule, carelessly and ignorantly thrown out of health. It must not be forgotten that the potato is not a hardy plant with us; it leads a somewhat unnatural life under adverse conditions, and it requires nursing. When potatoes are stored, they require, as conditions of the first importance, both dryness and coolness, whilst, as a rule, potato growers subject their potatoes to moisture and over-heating. Stored potatoes are commonly piled in heaps during the entire winter, and in these death-heaps the potatoes get

bruised, heated, and thrown completely out of condition. Stored potatoes are commonly in a hot-bed of disease. The potato tuber, thus fermented and damaged, is now commonly cut into pieces, and the pieces, whilst still wet, are too frequently placed in the furrows of the ground in actual contact with rank dung and refuse, this material being saturated with spores and vermin of all sorts. The potato has, by this time, more or less lost its constitution, and the position in which it is planted too often adds to its troubles, for when potatoes are grown in marshy places and on flat alluvial plains, they require a different mode of culture from the same plants as grown in dry calcareous earth. As a rule, too, potato growers crowd their plants too much together, and the potatoes are in as bad a plight for contracting disease as human beings and other animals are, when constantly kept in over-crowded, ill-ventilated places. The murrain of potatoes is not confined to the potato plant, for it attacks with equal virulence (especially has this been the case during recent years) the tomato. This latter plant, like the potato, requires special care in cultivation; and where this care is not forthcoming, the whole crop is utterly lost. The murrain also attacks various wild plants in this country (principally members of the family to which the potato belongs); but these plants being healthy, hardy, and natural to the soil and climate, throw off the murrain with ease, and rarely succumb. Records of facts of this class could be multiplied to an almost indefinite extent; hardy native and uncared-for subjects escape, whilst introduced subjects fall. For instance, there is a well-known disease of houseleeks named *Endophyllum sempervivi*. This is of the rarest possible occurrence on the hardy common houseleek of our roofs and gardens; but when the disease once gets amongst exotic species of *Sempervivum*, it completely destroys every plant. It is the same with the hollyhock disease, *Puccinea malvacearum*. The old hardy single hollyhocks of cottage gardens throw off the disease with ease, whilst the tender, highly-cultivated garden varieties are utterly destroyed. Peaches, when grown on walls and exposed places, fall a prey to a disesae named *Ascomyces deformans*, a disease almost unknown amongst peaches when carefully grown in fruit houses. Late fruiting garden peas are often completely destroyed by a fungus named *Erysiphe martii*, but this fungus has very slight effect on the hardy wild peas. The following observations belong to a similar class of facts. A race-horse may be as healthy as a waggon-horse, and may be able to live as long a life; and a well-tended spaniel as healthy as a Scottish shepherd dog; but one must be cared for in a different style from the other if life and health are to be equally satisfactory in both. I conclude, therefore, that the potato plant would not fall such an easy prey to the murrain if it received greater care in its general storage, planting, and cultivation. It now too often falls a prey to the infectious murrain in the same way as the unclean and improperly fed human beings of populous districts fall before certain diseases, whilst clean, well fed, and healthy individuals escape. Healthy, or apparently healthy, potato plants may occasionally succumb to the murrain in the same way as a doctor may occasionally die from fever communicated by a hospital patient. The second and last question 'Is it possible to prevent the destructive virulence of each annual assault of the fungus?' is far more difficult of satisfactory answer. I, however, most certainly consider a great reduction of the amount of disease to be quite possible. The attacks cannot be mitigated by cure, but a strong attempt might be made towards the prevention of the murrain. With a correct knowledge of the nature and cause, nearly every known disease can be prevented or palliated, especially when there is a specific poison in the case as with the potato disease. As for stamping out the murrain, or isolating cultural experiments to an island in the sea, a short

distance from the shore, any such attempt would be utterly futile. Spores are present everywhere, and can no doubt be carried through the air across a sea or ocean, as readily as over a hedge. Spores everywhere sail with the wind, and at the same speed. Nothing is better known than the descent of spores, pollen, and other minute organisms on to ships in mid-ocean. If potatoes were taken into an island in the middle of the South Pacific, or transported upwards for miles into the air, or submerged for years in a river, they would yet be liable to contamination from the *Peronospora*, for the spores of the fungus are everywhere. The resting spores have been kept alive for three years simply in pure water, and they germinated after this time. In fact, the only way to satisfactorily see the ordinary spores germinate is in water. I have for many years been in the habit of constantly using the microscope, and I have found the spores of the potato fungus on the most diverse objects, and in the most diverse positions, showing that the spores must have been blown for long distances in every direction. Now suppose the statement to be correct (although it is not correct) that the spores of the potato fungus are not carried far by the wind, are there no other means of dissemination at hand than disturbed air? Suppose a fox or hare runs through a field of infected plants, and then goes off to non-infected districts, he will carry tens of thousands of spores in his coat. Suppose a bird alights amongst infected potatoes, when that bird flies off he will carry tens of thousands of spores in his wings, and discharge them into the air as he sails over the country or the sea. The innumerable beetles, flies, moths, butterflies, and grubs found amongst potato plants commonly swarm with spores. When a farmer goes into his infected fields he inhales the spores into his lungs, and when he eats his fruit from the walls of his kitchen garden, he takes the spores into his stomach. From the above it will be clearly seen that any idea whatever founded on stamping out, can only be a wild dream. Prevention is the only means worthy of a moment's consideration. In my opinion a careful selection of tubers is first required. Many varieties of potatoes are known to be less liable to disease than others, and these varieties might be authoritatively recommended for cultivation, especially in those districts where the conditions for the spread of the potato disease are favourable, as in the low terraces and plains belonging to rivers and in humid districts. The fact that some varieties of potato are highly susceptible to disease will not admit of doubt, and such varieties should be confined for culture to greenhouses and calcareous or other suitable soils. We have facts of a similar class in the human family; for instance, some persons are constitutionally highly subject to zymotic diseases, as typhoid and diphtheria; other persons cannot go near a hay-field without contracting hay-fever. In opposition to being highly subject to special diseases, certain other individuals, both animals and plants, are equally able to throw them off. In a paper read by me before the Scientific Committee of the Horticultural Society, I detailed some experiments in which I inoculated, by actual grafting, the tubers of diseased potatoes into those of sound ones; in some instances a thick slice of a highly diseased potato was spliced into the substance of a sound one; the constitution of the host potato was, however, in some instances, so robust, that the host grew well, and with no effects of disease in its after-growth. I have also carried out similar experiments with the fungus of the hollyhock disease, and other plant diseases, and always with like results, viz., that infection was something simply impossible with sturdy plants. These facts also find a parallel in the human family, in the application of vaccine from the cow. In some individuals vaccination is entirely without effect as regards the production of cow pox. It may therefore be regarded as a certain fact that robust, early-ripening

varieties of potatoes might be selected for general cultivation with advantage. In the next place, it might be recommended that all potato tubers should be preserved through the winter in a perfectly dry place, and dusted with some caustic material. Thirdly, the cut tubers should never be placed in the furrows till the cut surfaces of the potato have healed, and never, under any circumstances, should they be placed directly on to farm-yard manure, or over-crowded, as they commonly are, in the furrows. Fourthly, special cultural directions might be printed for the proper growth of potatoes on peaty, sandy, loamy, calcareous, and other soils. Lastly, all potato refuse should be completely burnt every autumn, and never, under any circumstances whatever, ploughed in. If directions like these were scrupulously attended to, my belief is that the potato plant would in a few years be able to throw off attacks of the disease as easily as now does the wild plant of our hedges, the common bittersweet, *Solanum dulcamara.*

The Select Committee remarking upon the evidence of the scientific witnesses in their report, observe:—

"Only one witness, Professor Baldwin, believed in the possibility of stamping out the disease.[1] The scientific witnesses concurred in believing that it was possible and probable that we might find or develop varieties of potatoes which would be more capable of resisting the disease than those hitherto produced; they also believe that if an early potato could be extensively grown it might be ripened before the usual time for the development of the fungus. With regard to storing the crop, the scientific witnesses urged the necessity of preventing vegetable fermentation, which by causing heat favours the growth of the fungus; coolness and ventilation are the points to be studied, particularly with regard to potatoes for seed purposes.

"The scientific points on which further proofs seems necessary are, first, as to whether the summer spores are borne by the atmosphere to considerable distances, and, secondly, as to how the disease is carried over the winter, whether by resting spores, or by the mycelium, whether mainly in the seed, the ground, or the manure heap.

"The necessity for the production of new varitiess is concurred in by all witnesses."

---

[1] Professor Baldwin, Superintendent of the Agricultural Department of the National Board, Ireland, gave evidence on this point, as follows:—

How would you kill it out?—The possible way of killing it out is this: I do not take upon myself to recommend it to the Committee, but I take it upon myself to throw out for the consideration of this Committee whether something may not be done for the purpose of stamping it out in the future. The way of stamping it out is this: in one year to enact that no potato raised shall be planted the following year. I am merely submitting my opinion, and I do so with some diffidence as to the possibility of doing it. If the potatoes raised, say last year, had been all consumed and none planted; if no potato were to be sown in ground which had been cropped with potatoes the year before, or to make certain, say for two years before, and if you imported all fresh seed, I think you would effectually kill it out.

THE PRACTITIONER.

OCTOBER, 1880.

Original Communications.

ON THE PHYSIOLOGICAL ACTION OF AN ALKALOID EXTRACTED FROM THE GARDEN TULIP—NATURAL ORDER LILIACEÆ.

BY SYDNEY RINGER, M.D.,

Professor of Medicine at University College, London.

AFTER investigating the physiological action of the daffodil, narcissus, snowdrop, and Lemanthus, plants belonging to the natural order Amaryllidaceæ, I next turned to the study of the action of plants belonging to the closely allied order Liliaceæ.

Mr. Gerrard extracted for me an alkaloid from the bulbs, leaves, and flowers of the garden tulip, each pound of plant yielding a grain of nitrate of tulipine.

I first applied a 1 in 20 solution of the nitrate of tulipine to the eye of a cat, repeating the application frequently at a few minutes' interval. It produced some smarting, and very free salivation. The pupil remained unaffected.

Several days after this trial of the tulipine I applied a solution of nitrate of silver to the same eye to ascertain whether the salivation was due simply to irritation of the eye or to the topical action of the alkaloid on the mucous membrane of the mouth. Though the nitrate of silver irritated the eye far more than the tulipine solution, it produced very little salivation;

hence the alkaloid probably acted topically on the mucous membrane of the mouth.

On applying a little of the solution to his tongue Mr. Gerrard found that it caused tingling of that member, and of the throat—a tingling like that of aconite, lasting several hours.

I next tested the action of tulipine on frogs. I injected $\frac{3}{10}$ and $\frac{1}{5}$ grain of the nitrate respectively into two frogs, one weighing twenty-six and the other twenty-five grammes. In a few minutes the movements became stiff, suggesting the onset of tetanus. The stiffness increased, and the movements grew weaker; and then I noticed that the muscular contractions were peculiar. The muscle contracted slowly, and still more slowly relaxed; indeed the muscular movement exactly resembled that produced by veratria. Reflex action was soon lost, whilst some voluntary power still remained. On testing the muscles with the interrupted current, I found the contraction similar to that which occurred in a voluntary movement, the contraction being slow and the relaxation still slower. In about forty-five minutes the limbs became stiff on passive movement, whilst some voluntary movement remained and the muscles still contracted, both by direct electric stimulation, and by stimulation through their nerves. It seemed as if rigor mortis had set in before complete loss of muscular irritability. As the muscular contractility grew less, the stiffness of the muscles increased. In four hours all muscular irritability had ceased, notwithstanding the direct application to the exposed muscles of a strong interrupted current from a one-celled Daniels battery, with Du Bois Reymond's induction apparatus. At this time the muscles of an unpoisoned, brainless, test-frog contracted well; indeed sixteen hours after destruction of the brain the muscles contracted well with Du Bois Reymond's apparatus at fifteen centimetres' distance of the secondary from the primary coil.

Mr. North, Sharpey Scholar at University College, kindly took a tracing of the muscle-curve, and thus confirmed the phenomena previously described. It showed that the muscular contraction and relaxation are greatly prolonged, and at the same time weakened, so that at last the curve rises only just above the base line; yet the duration of the contraction, and

especially of the relaxation, is several times longer than in the tracing derived from an unpoisoned muscle.

From the early loss of muscular contractility, from the slow contraction and still slower relaxation of the muscle, and from the early onset of rigidity, it is evident that tulipine is a muscle poison.

We noticed that at a period when galvanic stimulation to the sciatic nerve caused the calf muscles to contract vigorously, all reflex action had ceased, showing that this alkaloid must paralyse either the afferent nerves or the reflex function of the cord. The small quantity of alkaloid at my disposal being now exhausted, I could not determine which of these structures the drug had affected. This alkaloid, as we have seen, affects not only the muscles like veratria, but like veratria also causes tingling, hence very possibly it is a poison to the afferent (sensory) nerves.

In frogs killed with tulipine I find the ventricle small, pale, and rigid, like the heart poisoned with veratria. Tulipine stops the ventricle sooner than the auricles.

Conclusions.

Tulipine differs almost entirely from the action of alkaloids derived from the plants belonging to the natural order Amaryllidaceæ so far as I have examined.

Tulipine is a muscle poison, affecting the muscles like veratria. It is, however, weaker than veratria.

It paralyses either the cord or the afferent nerves, or both; but probably it affects the afferent nerves.

Its action on the motor nerves if any, is but slight.

It affects the heart of frogs like veratria.

It does not affect the pupil.

ON CATARRHAL PNEUMONIA AND TUBERCLE IN THE HUMAN LUNG.

BY D. J. HAMILTON, M.B., F.R.C.S. ED., L.R.C.P. ED.,

Demonstrator of Pathology, University of Edinburgh, Pathologist to the Edinburgh Royal Infirmary.

(*Continued from page* 192.)

MASONS who work on certain kinds of stone suffer from a peculiar disease of the lungs, due to the inhalation of stone-dust, the symptoms of which resemble somewhat closely those of ordinary phthisis pulmonalis. I have never examined the body of a stone-mason who has worked in the neighbourhood of Edinburgh without finding evidence of the effects produced by stone-dust inhalation. One of the features of the disease is that nodules, about the size of a millet-seed, or a little larger, are scattered over the pleura and throughout the lung tissue, in the lines of the lymphatic vessels. They are extremely hard, sharply circumscribed, and occupy the same situations as secondary tubercles. When situated on the pleura, they are seen to be grey and cicatrix-like in the centre, and black at the periphery.

Now, when these deposits are examined microscopically, they are found to consist in great part of dense concentrically arranged bundles of cicatricial tissue, the particles of stone-dust lying in great numbers at the centre of the tumours and in the plasmatic spaces between the bundles. The stone-dust particles are very minute, and are either round or angular. They have a clear centre, and, when seen in mass, a greyish colour. They run in the course of the lymphatic vessels, and are occasionally accompanied by particles of carbon, which have been simultaneously inhaled. The cicatricial tissue is undoubtedly

caused by the stone-dust irritating the fibrous stroma of the organ. Giant cells are not found in these nodules, and the reason apparently is that the fibrous hyperplasia takes place gradually, so that abundant time is afforded for the nuclei of the stroma being organized. They do not rush into an embryonic existence, as in the case of tubercle, where the irritant is very acute, but pass through the stages of round and spindle cells very slowly, until the perfect fibres are produced. With this exception, however, the nodules in the stone-mason's lung are identical with tubercles. They in fact represent the ultimate development to which tubercles reach when sufficient time is afforded for their organization. In both instances the nodules are fibrous-tissue formations, the one being the result of an irritant acting acutely upon the fibrous-tissue nuclei, and the other the product of a less virulent stimulant acting upon the same over a long period of time.

On the Mode of Development of Secondary Tubercle accompanying Cirrhosis of the Lung.

As secondary tubercle of the lung is of much slower growth than the primary variety, its mode of origin can be studied with exactitude. The first thing observable, in parts which are not as yet cirrhotic, is a little swelling on one side of an air-vesicle. This increases in dimensions, and then invaginates itself into the alveolus. It is by this process of invagination into the air-sac that space is afforded for the growth of the tubercle. Fig. 23 shows how such a tubercle originates from the wall of the alveolus. The walls of the air-vesicle are seen at *d*, and the tubercle nodule is noticed to occupy the greater part of the cavity. It is still connected by two pedicles with the alveolar wall, and I have sometimes seen as many as three or four such attachments of a tubercle nodule, which otherwise was lying free in the alveolar cavity. The nodule, as it increases in dimensions, becomes polypus-like, by drawing after it some of the alveolar structures, and these constitute the pedicle. The alveolar epithelium is also pushed forwards, and forms an investment for

the tumour. The epithelial cells are represented at *c*, in the figure lying over the pedicle.

Not only does an isolated tubercle nodule grow in this way by invagination, but, when one has so arisen, many secondary outgrowths may be produced, by the same invaginating process, from the original mass. Such conglomerations of giant-cell systems as those represented in Fig. 22 are formed in this manner, and the extent to which the lung-tissue may be involved by such supernumerary growths is sometimes very great. A few tubercle

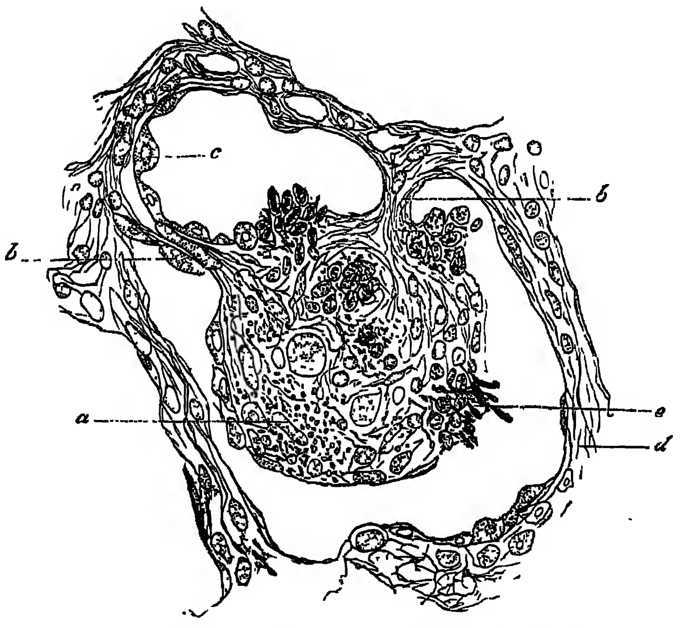


FIG. 23.—Secondary tubercle of the lung, showing how it invaginates itself into an alveolar cavity. *a*, the tubercle in an early stage of development; *b b*, the pedicles which attach it to the alveolar wall; *c*, alveolar epithelium which is pushed forwards by the tubercle and forms an investment for it; *d*, the alveolar wall; *e*, pigment particles, originally situated in the fibrous tissue of the alveolar wall, but which have now been carried forwards, and form part of the tubercle nodule.

nodules are first formed in a localized area, and then from their borders off-shoots are projected, by a process of invagination, into the neighbouring air-vesicles. The lung becomes almost solid at such parts, from the immense masses of tubercles which are

thus called into existence. In the course of time the tubercle outgrowth comes to fill the air-sac, and their walls become contiguous. I have not been able to make out what becomes of the two adjacent layers of alveolar epithelium. They disappear, apparently, by undergoing atrophy from the pressure of the tubercle growth; so that when the tubercle has reached its maximum size the alveolar walls and the substance of the tumour become united, what was formerly the alveolar wall now representing the boundary of the tubercle. Certain of the tubercles seen in Fig. 22 undoubtedly have been produced in this way, their sharp borders in fact representing what was formerly the wall of an air-vesicle.

In this respect, therefore, the growth of primary and of secondary tubercle, although in the former it is more rapid than in the latter, is alike. No doubt there are many tubercles in the secondary disease which do not follow this process of invagination, as, for instance, those which are placed in the centre of a very cirrhotic part of the lung, or in an interlobular septum. Here the growth is purely interstitial, and the tubercle involves merely the surrounding cicatricial fibrous tissue. But, where the tubercles lie apart from the cirrhotic portions of the lung, and here their development can be best studied, the manner in which they grow into the air-vesicle is practically the same as that seen in the primary disease. The true difference in their mode of development is, in reality, to be found in their points of departure, in the one case being the blood-vessels, in the other the lymphatics. Their subsequent course is alike.

THE DEGENERATIONS OF TUBERCLE.

The structure of a tubercle when fully developed has already been described, consisting as we have seen of a giant-cell fibrous network. In many tubercles, however, all the parts of the typical giant-cell system are not seen. The reason of this is that the tubercle is liable to degenerate, so that it is destroyed before or after being completed. The giant-cells are always present, but the reticulum, being a formation of later date, may not be noticed in certain instances.

The commonest degeneration to which tubercle is liable is the caseous. From the manner of its formation, necessitating as it does the destruction of the capillaries in the neighbourhood, the blood-supply of the tubercle is liable to be cut off at an early stage of its development. More especially is this true of primary tubercle of the lung, where the nodules arise from the blood-vessels. Such tubercles always show evidence of caseous decay, so that frequently the structure is arrested before it is complete. Secondary tubercle is of slower growth, and being of lymphatic origin is not so liable to implicate the vessels at an early period. Even here, however, after a time, many of the nodules become caseous (Fig. 22, *e*).

The granular appearance characteristic of caseation is always first perceived at the centre, and, when softening occurs, a microscopic cavity may result. Such cavities, however, *do not* run together to constitute larger ones, for, as soon as the centre of the tubercle has softened and has been absorbed, the peripheral fibrous part contracts, so as to obliterate the space which has been left. I have never seen such a thing as phthisis pulmonalis resulting from caseation and softening of tubercle nodules, and I do not believe that there is in reality such a thing as "tubercular phthisis," in the ordinary acceptation of the term. No doubt the gumma-like masses which have been previously described as complicating secondary tubercle of the lung, accompanied by cirrhosis, do sometimes soften and form minute cavities, but these are due to accidental obliteration of the blood-vessels, and are more an accompaniment of the cirrhosis than of the tubercle.

Secondary tubercle of the lung, on account of the cirrhosis which is associated with it, may lead, and often does lead, to bronchiectatic excavation. Such cavities are constantly mistaken on casual examination for cavities produced by dissolution of the lung-tissue, and the disease is called pulmonary phthisis. There is not in reality, however, in such a case, any destruction of lung-tissue from softening. The disease is purely one of cicatricial contraction, leading to bronchial dilatation.

If, then, the tubercle caseates in the centre, what becomes of the caseous débris? The softening takes place locally, not *en masse*, as in a catarrhal pneumonia; and, as the caseous

centre of the tubercle liquefies, it is entirely absorbed by neighbouring lymphatics, and is removed in this way. The periphery of the tubercle, which is the most fibrous part, meanwhile contracts; so that, as absorption of the centre takes place, the whole tumour, as before mentioned, shrinks, and thus prevents the formation of a cavity.

The caseous matter, in the course of time, is removed in this way by the lymphatic vessels, and is capable of again exciting tubercle growths within them at some distant part. Thus it follows that when tubercle is set up in an organ there is extreme difficulty in getting rid of it. For, once given a caseous centre, infinite numbers of generations of tubercles may originate from this, each individual tumour, as it caseates, propagating an offspring of young tubercles in its vicinity.

There is the closest analogy between the caseation of a gumma and that of a tubercle. A gumma is a caseous mass situated in the midst of dense cicatricial tissue. It is a well-known fact that it may be absorbed, but that it has little tendency to form a cavity. The reason of this is that, as the softening and absorption of the caseous mass proceeds, the cicatricial tissue around shrinks, and prevents any vacuity taking place.

The other degeneration to which tubercle is liable is the fibrous. Indeed this can hardly be regarded as a degeneration, seeing, as previously described, that it is the ultimate destiny of all tubercles to become fibrous if they live long enough. It is of common occurrence, especially in *secondary* tubercle of the lung. It has previously been shown how the fibrous transformation is brought about—how the giant-cells and their reticular processes gradually become developed into fibrous tissue, and how, finally, nct any trace of the previous giant-cell system is to be found. Fig. 22, *f*, shows a giant-cell system which has undergone this fibrous development. The other giant-cell systems, which are seen in the same tubercle at the side, are probably young offshoots from that which is fibrous, and in which, consequently, the fibrous degeneration has not as yet occurred. Such an appearance is very common in secondary tubercle of the lung.

Even such a tubercle (*e*) as that seen below the one which is fibrous (*f*), although at present caseous in the centre, would, when the caseous matter was absorbed, ultimately become converted

into a fibrous mass, without any perceptible tubercle-structure. A circumscribed fibrous tumour, in which the bundles of fibrous tissue are fully developed, with plasmatic spaces lying between them, is what it becomes transformed into. Where, however, the centre has been destroyed by caseation, the rounded shape which the nodule originally had is lost, and an elongated fibrous thickening is all that is left.

The combination of secondary tubercle with cirrhosis of the lung has been sufficiently dwelt upon, and it was assumed that the cause of the cirrhosis is a chronic bronchitis. There seems, however, very little doubt that the tubercles which form in the organ during the course of the disease are also a fertile source of fibrous overgrowth. Indeed, I look upon the presence of tubercles, in such a case, merely as a peculiar variety of fibrous hyperplasia, which ultimately terminated by adding to the cirrhotic condition of the organ. The whole character of parts of the lung which have not been primarily cirrhotic, but into which the tubercles have secondarily extended, shows that this is the ultimate destiny of these tumours. The tubercles in such places are formed first, and a localized cirrhosis follows. An organ which is cirrhotic in one limited area to begin with may thus, by the fibrous transformation of the tubercles which are developed from it, become wholly beset with fibrous tissue, the tubercles in the course of time losing their characteristic shape, and giving rise to a widespread cirrhosis.

The same thing is sometimes seen in the liver, more especially in children. It has often been shown that children suffer from cirrhosis of the liver. Several cases of the kind have lately been recorded in this country and abroad. Klebs draws attention to what he calls "miliary syphilitic new formations," which occur in the livers of children (*Handbuch der pathologischen Anatomie*, p. 440). He seems to assume that they are syphilitic because he cannot otherwise account for them. They occur, according to him, in the interstitial tissue of Glisson's capsule. They are yellow in colour, and, he confesses, have a close resemblance to tubercles.

I have met with one or two instances of this disease, and have made very careful examination of them. I consider there is not the slightest doubt of the disease being tubercular.

There is, however, this peculiarity about it, that it is accompanied by a diffuse cirrhosis, which, the longer the child lives, becomes more and more developed. A little careful study of the nodules easily convinces one that they are the source of the cirrhotic fibrous tissue. The tubercles are very thickly scattered through the organ; they degenerate, or rather organize, into fibrous tissue; one such fibrous mass joins with another; and, in this way, an interlacing network of fibrous tissue results, producing shrinking in the volume of the organ, as in an ordinary cirrhosis in the adult. In the course of time the tubercles may all disappear, and nothing but the cirrhotic bands arrests the attention. This disease of the liver in children is analogous to many cases of tubercle of the lung in the adult, for, in both, the tubercles lead to fibrous new formation. We are too much inclined to look upon tubercle as necessarily a fatal disease, without discriminating between its effects in an organ such as the liver, and those in a part like the cerebral pia-mater. Tubercle of the pia-mater is a fatal disease merely because it affects a vital part, but where it occurs in an organ such as the liver, it causes no further acute disturbance than so many encysted parasites would in a similar situation.

What then becomes of those tubercles, where a fatal issue does not at once ensue? In children of a strumous constitution caseation and softening of glands is of very common occurrence. Some infecting material must be absorbed from these, and, being transported by the blood-stream into neighbouring parts, will give rise to tubercle formation in them. If, however, vital parts, such as the meninges escape, tubercular deposits may take place in many other organs without necessarily causing a fatal result, usually with very little constitutional disturbance. The child lives, perhaps for several years, and I have very little hesitation in saying that the tubercles conduce by their fibrous organization to a cirrhosis of the organ in which they are placed. Certain cirrhotic states of the organs of children are thus accounted for which otherwise have not any appreciable cause of origin.

ON THE TREATMENT OF THE NIGHT-SWEATING OF PHTHISIS.

BY WILLIAM MURRELL, M.D, M.R.C.P.,

Senior Assistant Physician to the Royal Hospital for Diseases of the Chest, Lecturer on Practical Physiology at the Westminster Hospital.

(*Continued from* Vol. xxv. *p.* 100.)

XII. Homatropia.

My attention was directed to the subject of Homatropia by Ladenburg's paper in the *Comptes rendus* (tom. xc. No. 15, p. 874), and by an article by Mr. Tweedy and Dr. Ringer which appeared in the *Lancet* of May 22nd, 1880. From a consideration of its physiological action, and especially from its analogy to atropia, I hoped that it might prove a useful addition to our list of remedies for morbid sweating.

As a preliminary step I determined to test my drug by repeating some of its physiological reactions.

Two minims of a 1 in 120 aqueous solution of hydrobromate of homatropia rapidly dilated the pupil. The drug was applied topically at 6.15 P.M; at 6.30 there was dimness of vision, and on examination five minutes later it was found that the pupil was fully dilated. For the remainder of the evening reading was performed with the greatest difficulty, and work of any kind was impossible; but on the following morning accommodation was re-established, and the pupil had nearly regained its normal size.

A toad weighing $25\frac{1}{2}$ grammes injected with ♏v of a 1 in 60 solution of hydrobromate of homatropia (gr. $\frac{1}{12}$) remained unaffected. A toad weighing $22\frac{1}{2}$ grammes injected with ♏x of the same solution (gr. $\frac{1}{6}$) presented symptoms of paralysis

in the posterior extremities in twenty-five minutes. Tetanus commenced in one hour and ten minutes. The tetanus and paralysis lasted four days, and recovery was complete.

A toad weighing 21 grammes was injected with ♏xx of the same solution (gr. $\frac{1}{3}$). Paralysis commenced in twenty minutes, and tetanus in one hour and six minutes. Paralysis and tetanus lasted ten days, and recovery was complete.

A toad weighing 25 grammes was injected with ♏xxx of the same solution (gr. $\frac{1}{2}$). Paralysis commenced in seven minutes, and was almost complete in half an hour. There was no tetanus, and the animal did not recover.

The tetanus of homatropia, though less powerful than that of strychnia, is still very marked, the slightest touch sufficing to induce a paroxysm. It was noticed that as the paralysis progressed the tetanus became stronger, and as the paralysis passed off the tetanus subsided. The action of homatropia on the cord forcibly illustrates our views respecting the true nature of tetanus (*Transactions of the Medico-Chirurgical Society*, 1876, and *Journal of Anatomy and Physiology*, April 1877). The duration of the tetanus and the large dose required to produce a fatal result are worthy of attention.

The antagonism of homatropia for muscarine is very marked. A toad was pithed and the thorax opened. The heart was beating well, forty-four in the minute. On the application of a 1 in 4 solution of extract of muscaria it became feeble and fell in five minutes to twelve, in nine minutes more it was six, and in twenty-nine minutes it stopped. Homatropia was then applied; in a minute the heart commenced beating; in three minutes it was contracting strongly, twenty-two in the minute.

Homatropia antagonises pilocarpine. A young woman with aphonia was given an injection of a third of a grain of nitrate of pilocarpine. Whilst sweating profusely, she had an injection of ♏v. of a 1 in 60 solution of homatropia (gr. $\frac{1}{12}$), and in three minutes the perspiration ceased.

These observations are confirmatory of Dr. Ringer's experiments.

The first case in which homatropia was given clinically serves to illustrate its capabilities as a remedy for the night-sweating

of phthisis. The patient was a young man of 18, a clerk in a bank. His symptoms were of some six months' duration and included violent cough, with profuse expectoration, great dyspnœa on exertion, hæmoptysis, and considerable loss of flesh. He had crepitation at the right apex, and there was cavernous breathing in the left infra-clavicular region. He was in a miserable condition, had hardly any appetite, and could get about with the very greatest difficulty. He had suffered from profuse night-sweating for about a month, and a night never passed without his finding his things wet through, even in the day-time he perspired profusely on the slightest exertion. On May 24th he had a hypodermic injection of ♏ii of a 1 in 120 solution of hydrobromate of homatropia (gr. $\frac{1}{60}$); on the 25th he had ♏iii (gr. $\frac{1}{40}$); on the 26th, ♏iv (gr. $\frac{1}{30}$); on the 27th, ♏v (gr. $\frac{1}{24}$); and on the 28th, ♏vi (gr. $\frac{1}{20}$). Until the night of the 28th little or no benefit was experienced, the sweating might have been less, he thought, but at all events he was not much struck by the improvement. On the 28th, 29th, 30th, and 31st, there was no night-sweating, and the injections were temporarily discontinued. On June 1st they were recommenced, partly with the view of preventing the recurrence of the sweating, and partly to ascertain what dose could be given with safety. On June 1st, he had hypodermically ♏vii of the 1 in 120 solution, on the 2nd, ♏viii (gr. $\frac{1}{15}$); on the 3rd, ♏ix; on the 4th he was given ♏v of a 1 in 60 solution (gr. $\frac{1}{12}$); on the 10th, ♏xii of a 1 in 120 solution (gr. $\frac{1}{10}$). From the 7th to the 12th there was a little perspiration every night, but it was not enough to cause any inconvenience. On the 14th and 15th he took by mouth, in the form of pill, gr. $\frac{1}{10}$, three times a day, without the production of any symptom. On the 17th at 11.45 A.M. he was given a hypodermic injection of ♏x of a 1 in 60 solution (gr. $\frac{1}{6}$), and he then for the first time complained of unpleasant symptoms. He said he felt very strange and dizzy all the way home. He was going down Portland Place a few minutes after the injection had been given, when he found he could not walk straight. He nearly fell down several times, and he was sure people noticed him, for a lady remarked that it was a sad thing to see a young man in that condition so early in the morning. His head went round

and round, he had a curious sickly sensation, and everything seemed to be mixed up together. He could see nothing plainly. This lasted about four hours, but all the rest of the day he felt giddy and uneasy. For the next fortnight he had little or no sweating, and it was then determined to give him a hypodermic injection of atropia by way of comparison. On July 5th he had accordingly ♏ii of a 1 in 160 solution of sulphate of atropia (gr. $\frac{1}{80}$), and from this he experienced no inconvenience. On the 12th he was given an injection of 3 minims of the same solution. He had hardly left the door when he felt so dry and thirsty that he was compelled to have a glass of ale. This made him worse, and his throat got dryer and dryer, so that when he got home, he was quite overcome and began to cry. He felt burning hot, he says, and his skin was harsh and dry. He was not giddy and not sick, but his sight was a little dim. The worst of it passed off in about an hour and a half, but he had no appetite for the rest of the day. He subsequently did well on extract of malt, and other remedies. The homatropia seemed to arrest the sweating, but it acted somewhat imperfectly, and the result was not so satisfactory as could have been wished.

In the case of a man aged 32, suffering from advanced phthisis, the following doses of homatropia were given hypodermically: on the 24th, gr. $\frac{1}{80}$; on the 31st, gr. $\frac{1}{20}$; on the 7th, gr. $\frac{1}{15}$; on the 10th, gr. $\frac{1}{10}$. He had had profuse night-sweating for six weeks. No benefit was derived from the gr. $\frac{1}{80}$, but the $\frac{1}{20}$ and larger doses gave some relief, although the effect was not very marked. He then took, from the 14th to the 17th, gr. $\frac{1}{10}$ in pill three times a day, without much benefit. From the 17th to the 28th inclusive he took two of these pills nightly without, as he said, their making much difference. One night he took three of the pills without benefit. A single injection of gr. $\frac{1}{80}$ atropia at once arrested the sweating.

In the case of a phthisical lad, aged 16, who had suffered from profuse night-sweatings for three weeks, the following doses of homatropia were given hypodermically. On the 24th, gr. $\frac{1}{80}$; on the 27th, gr. $\frac{1}{30}$; on the 31st, gr. $\frac{1}{20}$; on the 3rd, gr. $\frac{1}{15}$; on the 7th, gr. $\frac{1}{12}$; on the 10th, gr. $\frac{1}{10}$ Very little benefit was experienced until the dose reached gr. $\frac{1}{20}$, and then

the sweating was certainly checked for three or four nights. On the 14th a gr. $\frac{1}{10}$ homatropia pill was ordered three times a day, the last to be taken at bedtime. The pills were taken for four days, but they failed to check the sweating; one night after taking them "he was as wet as if you had thrown a bucket of water over him." After the injection of the gr. $\frac{1}{12}$ patient's pulse fell 16 beats in ten minutes, but he experienced no subjective symptoms. Once or twice he complained that after the injection his arm was sore, and that for the rest of the day it was so powerless that he could hardly use it. Subsequently an injection of ♏ii of a 1 in 160 solution of atropia failed to check the sweating, and the benefit derived from three minims was comparatively slight. He was a cabinet-maker by trade, and always sweated very much at his work.

In another case the patient, a woman aged 46, had on different occasions hypodermic injections of gr. $\frac{1}{60}$, gr. $\frac{1}{20}$, and gr. $\frac{1}{6}$ of homatropia. She derived no benefit from the $\frac{1}{60}$ gr., but the larger doses lessened the sweating, though only slightly. She complained that the injection made her arm sore, but she experienced no other inconvenience from it. As the perspirations continued, she was given ♏iii of a 1 in 160 solution of atropia. She said that going home she felt very giddy—"it was a strange feeling"—she could not describe it, but she was afraid she would fall. Her face, she said, was a bright scarlet, and her mouth was quite dry, although it was full of foam, just like a person who has had a fit. It did the perspiration much more good than the other, although it upset her very much. She was all right the next morning.

In some instances the results were more favourable. Thus in the case of a man aged 50, with a little crepitation at the left apex, the homatropia certainly did good. He was given gr. $\frac{1}{60}$ without benefit. Three days after he was given gr. $\frac{1}{30}$, and this checked the sweating slightly. He then had gr. $\frac{1}{20}$; the sweating stopped, and for a month there was no return.

It is probable that the sixth of a grain is the maximum dose that can be given hypodermically with safety, and even smaller quantities will occasionally produce unpleasant symptoms. Thus a young woman of 20 was given an injection of gr. $\frac{1}{10}$. On going out she "felt giddy," "seemed as if she had not the

proper use of her limbs," and had to keep up against the railings all the way home for fear of falling. For three or four hours she "felt very bad," she "could see nothing properly," "everything she looked at was misty," and she felt "as if she must fall on her face." From a hypodermic injection of ♏iii. of a 1 in 160 solution of sulphate of atropia, she experienced somewhat similar symptoms. A "mist appeared before her eyes," she "felt giddy," "could not walk straight," and had to have assistance to get home. Her "mouth was dry," and "she foamed, just like any one in a fit."

Another woman, aged 38, who had a hypodermic injection of gr. $\frac{1}{10}$ of homotropia complained that it not only did her sweating no good, but it upset her the whole of the next day. It made her low-spirited, and her arm was so bad that she could not work.

I gave fifty hypodermic injections of homatropia to sixteen patients suffering from the night-sweating of phthisis, and although the drug has undoubtedly the power of checking the hyper-secretion, the results were not sufficiently satisfactory to justify the belief that it would rank high as a remedy for this distressing symptom. It is decidedly inferior to atropia, Dover's powder, picrotoxine, and other means at our disposal. The price too is at present prohibitive.

INDIGESTION AS A CAUSE OF NERVOUS DEPRESSION.

BY T. LAUDER BRUNTON, M.D., F.R.S.

To most men who are engaged in intellectual work, an autumn holiday has become a matter of necessity, and is not to be regarded as a mere luxury. During eleven months of the year many who are engaged in brain work systematically overtax themselves, trusting to the month's holiday to bring them again into proper working order. Formerly this was not the case. Men seemed to be able to go on, not only month after month, but year after year, without any vacation at all. The circumstances under which they lived were different from those which exist now. The very means which facilitate our holidays—the network of railways which puts us into complete and easy communication with any part of the Continent of Europe, or the quick ocean steamers which enable us to enjoy half of a six weeks holiday on the other side of the Atlantic, as well as the telegraphic communications which will warn us in a moment, even at the most distant point of our travels, of any urgent necessity for immediate return—all these are the very means which increase our labour during the greater part of the year. We live at high pressure, letters and telegrams keep us constantly on the *qui vive*, express trains hurry us miles away from home in the morning and back again in the evening, and the pressure of competition is so great that few men can afford either to take their work easily or to modify the constant strain of it by breaks of a day or two at a time. Wearied and exhausted, the hard-worked man goes off for his autumn holiday and, if he can, will spend most of it in the open air, either yachting, walking by the sea-shore, strolling in the country,

shooting on the moors, or climbing the Welsh hills or the Swiss mountains. After a month spent in any of these ways, the brain-worker comes back to town feeling himself a different man. Instead of his work being a slavery to him, as it was before he started, he feels it to be a pleasure; he gets through it with ease, and feels not only that the amount he can accomplish is greatly increased, but that the quality is also improved. Perhaps for a short time after his return he is hardly in a condition to do brain-work at all. He sits down to his desk but feels cramped in the unaccustomed posture, and he would rather work off the superabundant energy within him in a long walk or a stiff climb, than restrain it with difficulty to the simple task of driving a quill. After a week or two he settles down and works steadily along with comfort and ease for a couple of months or more, when he again begins to sink below par. His apprehension is no longer so acute, his power of concentration is diminished, he can no longer fix his attention for any length of time upon one subject without a severe effort. His mental vision becomes less perspicuous, his ideas succeed each other more slowly, and find expression with greater difficulty, so that he communicates his thoughts with less fluency and less clearness than before. His temper, too, undergoes a change. Instead of regarding the daily occurrences of life with equal nimity, and making the best of what cannot be helped; irritation so slight as to be unfelt at other times provokes him to anger or peevishness, and even when he possesses sufficient self-control to restrain his feelings and prevent them from being manifested outwardly, to the annoyance of his friends or neighbours, the very effort of restraint seems to increase the internal irritation, until at last it either explodes in an ebullition of wrath on some comparatively trivial circumstance, or tells upon the digestion and nervous functions of the individual himself, diminishing the appetite or causing intense muscular weariness. In others, again, we find that along with or taking the place of irritability there is great mental depression. Everything is looked at from a gloomy point of view, himself, his friends, and his surroundings. He does not feel equal to his work; nothing that he does pleases him; he is apt to become distrustful of himself and jealous of others; apt to think that his friends are slighting him, or to

fancy that he has offended them. Even when all external circumstances leave nothing to be desired, the unfortunate victim cannot enjoy life. His mind is occupied with gloomy forebodings of miseries to come, or he becomes a prey to melancholy and depression without any apparent reason. This melancholy weighs most deeply upon him during the night, and if he happens to wake in the small hours of the morning, as he not unfrequently does, life seems not worth living, but a burden of which he would willingly be quit Melancholy is at times associated with sleeplessness, and then the two evils re-act upon and increase each other. For this causeless sorrow has a similar effect to that of real sorrow. As Shakespeare says:

> "Sorrow's weight doth heavier grow,
> Through debt that bankrupt sleep doth sorrow owe."

At other times instead of sleeplessness there is an abnormal tendency to drowsiness, which sometimes comes on almost irresistibly at the very moment when some important work, requiring all the best powers of the intellect, has to be performed, and rendering its performance either imperfect or completely impossible. As soon as the person goes to bed he falls asleep, and sleeps like a log till morning, when he rises with difficulty, feeling almost more exhausted than when he went to bed the night before, with perhaps a little tightness or pain over the forehead, eyes, or temples. After breakfast he feels somewhat revived, and will work comfortably for a short time, but about one and a half or two hours after the meal weariness overtakes him, again passing off after it has lasted a variable time. During the day this is repeated, fits of more or less energy alternating with periods of languor and exhaustion. These languid fits may be noticed two or three hours after lunch or dinner, and the sufferer is not unfrequently tempted to have recourse to the decanter of sherry or the brandy bottle, not only to obtain relief from the feeling of personal discomfort, but to supply the energy which he feels to be necessary to enable him to do the work he has in hand. But this is a ruinous course to adopt, for not only does it pave the way to habits of confirmed drunkenness, and leads to tissue changes which will ultimately abolish the functional activity of the most important organs of the body, and bring the individual

to a premature grave; it enables him to do his work only imperfectly at the time. After an application to the decanter or bottle his powers may seem to himself to be as great or greater than usual, but this is to a considerable extent a subjective feeling only, as he will probably be able to discover by results.

Now how is it that such a change has come over the man in a few months, so that he seems to be a different individual from the one who returned, bright and lively, from his autumn holiday? How is it that the even-tempered man has become irritable, the clear-headed man muddled, the active lazy, the sober perhaps a tippler, and the cheerful and buoyant depressed and melancholy; that the brain performs all its functions with difficulty, and the mind is so altered that it does not seem to be that of the same individual? And yet, after all, the man is the same, and the brain is the same, at least in its essential structure, as it was a few months ago, and as it will be in a few months more, after another holiday has again put it in good working order. What has happened to it in the meantime to cause such a dreadful alteration? Not only does the brain seem exhausted, but the whole system appears to be languid and weak; instead of the man being able for a twenty or thirty miles walk, one of a mile or two will produce fatigue, and sometimes an intense languor is felt without any exertion at all. And yet all this time he may have been trying to keep up his strength. He takes butcher's meat three times a day, perhaps also strong soups, to say nothing of wine, or brandy and soda to pick him up. His tissues ought to be getting sufficient nourishment to enable them to do their work, and yet it is evident that they are not in a condition to do so. The man, and very likely his friends also, wonder at his condition, and when he goes to his medical attendant to describe his case he says, "I take all sorts of strengthening things, and yet I feel so weak." If, instead of using these words, he were to say "*Because* I take all sorts of strengthening things I feel so weak," he would express a part at least of the truth. He, and his friends who wonder with him, forget that all the functions of life are more or less processes of combustion, and that they are subject to laws similar to those which regulate the burning of the coal in our fireplaces. Two things are necessary for the combustion, fuel

and oxygen; sometimes it is the fuel that fails, but not unfrequently it is the oxygen. Sometimes, no doubt, our fires go out because the fuel is quite exhausted, but this is very rarely the case. It is only under very exceptional circumstances that we find a fire burned away so completely as to leave nothing but ash. Almost invariably some fuel still remains—often, indeed, enough to make up a good fire when properly put together. If we sift the ashes from the grate we generally find a quantity of cinders, sufficient to make a fire, and these have ceased to burn because they were unprovided with oxygen, which was prevented from reaching them by the ashes with which they were covered.

The reason why our fires burn low, or go out altogether, either is that we put on too much coal, or that we allow them to be smothered in ashes. It is the child who pokes the fire from the top to break the coal and make it burn faster; the wise man pokes it from below so as to rake out the ashes and allow free access of oxygen. And so it is with the functions of life, only that these being less understood, many a man acts in regard to them as the child does to the fire. The man thinks that his brain is not acting because he has not supplied it with sufficient food. He takes meat three times a day, and beef tea, to supply its wants, as he thinks, and he puts in a poker to stir it up in the shape of a glass of sherry or a nip from the brandy bottle. And yet all the time, what his brain is suffering from is not lack of fuel, but accumulation of ash, and the more he continues to cram himself with food, and to supply himself with stimulants, although they may help him for the moment, the worse does he ultimately become, just as the child's breaking the coal may cause a temporary blaze, but allows the fire all the more quickly to become smothered in ashes. It would seem that vital processes are much more readily arrested by the accumulation of waste products within the organs of the body than by the want of nutriment to the organs themselves. In all cases of fasting whether voluntary or compulsory, life is prolonged to a much greater extent if water be freely supplied. Without water the individual quickly dies, however much other nourishment he may get, but with abundance of water he may live for a considerable time, even if he take no solid nutriment at all. Here it is not

that the water acts as a food; it supplies no new energy to the body, for unlike starch, or sugar, or fat, or proteids it has already undergone complete combustion. It cannot like them unite any further with oxygen and thus supply energy.

And yet it is more essential to life than any of them, for without it the products of waste cannot be removed from the tissues, and the vital fires, so to speak, are smothered in their own ash. If we take the excised muscle of a frog and stimulate it to repeated contraction, the contractions become feebler and feebler, until at last they cease altogether. But this is not because the fuel which the muscle contains in itself has been so completely burned up that none of it is left to furnish the requisite energy to the muscle, it is because the chemical processes necessary to the contraction of the muscle, are arrested by the accumulation of the products of its own waste. If we wash these out of the muscle by sending through its vessels a weak solution of common salt, which supplies to it no new material, but which removes these waste products, the contractile power of the muscle will be restored.

This restoration takes place still more quickly and thoroughly if we employ a fluid which will supply oxygen, such as a solution of permanganate of potash, instead of a simple solution of salt, which merely washes out the muscular waste. The muscle is like a fire in the grate, which goes out long before the coal is entirely consumed, on account of the ash which smothers it, and just as we can revive the smouldering embers by supplying them with oxygen by the use of bellows, so the muscle revives more quickly when its supply of oxygen is increased The quicker the fire burns the sooner will it be choked in ash, and the more rapidly the muscle contracts the sooner will it lose its powers.

The same is the case with the heart. The slowly beating heart of a crocodile will pulsate for a day or more after it has been cut out of the body, but the rapidly pulsating heart of a mammal will very soon cease to beat; and the more rapidly it has been beating before the animal's death, the sooner will it cease to contract afterwards. If the vagi are cut in the living animal so that the cardiac pulsations become excessively rapid, the heart's movement ceases almost as soon as the animal

dies; but if during life the vagi are irritated so as to make the heart contract very slowly indeed, it comes to resemble more nearly the heart of the crocodile, and continues to pulsate for a considerable time after the animal's death. The heart, too, resembles voluntary muscles, inasmuch as if we wash out of it the products of its own waste it will continue to beat for a much longer time than if we allow them to accumulate. By simply allowing a saline solution to circulate through the heart of a frog it may be kept beating for many hours longer than if it were left to itself. Both voluntary muscles and involuntary ones, such as the heart, cease to act, almost invariably, not by exhaustion of their energy-yielding substance, but by accumulation of the waste products within them; and muscles, both voluntary and involuntary, are much less sensitive to this process of choking than the delicate structures of the nerve centres. The gastrocnemius or the heart of a frog, may retain their irritability for very many hours after their separation from the body, but the spinal cord of the same animal will rarely retain its irritability for a single hour after the circulation through it has been arrested. In warm-blooded animals the spinal cord is much more sensitive than in the frog, and if the circulation in the lower part of the spinal cord be arrested in a rabbit by the pressure of a thumb upon the aorta for three or four minutes, the hind legs of the animal will become completely paralysed. Still more sensitive than the spinal cord is the brain, and if the circulation in the latter organ be arrested, consciousness is almost instantaneously abolished. In the animal body as in the steam-engine, the governing and directing parts are much more sensitive and easily acted upon than the working parts. A single touch of the hand to the steam valve will set the engine in action or stop its movement, although the power of a thousand men applied to the fly-wheel would avail little or nothing. And in animals the nerve centres are most sensitive and respond most readily to those circumstances which affect the organism. Not only are they exceedingly sensitive to the accumulation within them of the products of their own waste, but they are easily affected by alterations in the blood which circulates through them, and which conveys to them not only the products of muscular and

glandular waste formed in other parts of the body, but also substances introduced from without, or absorbed from the intestinal canal. A single whiff of nitrite of amyl is sufficient to dilate the blood-vessels; a fraction of a grain of pilocarpine will stimulate the sweat glands to the most profuse secretion; and half a drop of pure hydrocyanic acid is enough almost instantaneously to abolish consciousness and destroy the functional activity of the entire nervous system. In the case of the nitrite of amyl, the pilocarpine, or the hydrocyanic acid, we are able to distinguish the relation of cause and effect between the administration of the drug and the resulting changes in the organism. We do this, however, because of our knowledge, obtained by observation and experiment. Sometimes we cannot do this. I have seen, for example, a person become aware of a peculiar sensation which, to the patient, was quite unaccountable, but of which I understood the reason, as I knew it to be due to the fumes from a bottle of nitrite of amyl, which the patient could not see. We may notice a similar occurrence in poisoned animals. The poison of the cobra causes paralysis of the spinal cord and nerves, and induces intense weakness, so that the limbs of the animal fail under it. I have seen an animal in this condition attempt to walk and look round at its legs with a puzzled air, as though it could not understand what was the matter with it. It could not connect the weakness in its limbs with the introduction of the poison some time previously, although the connection between them was to me perfectly clear.

In the same way as the action of the cobra poison was a mystery to the animal, an epidemic of typhoid fever was formerly to us a mysterious occurrence for which no reason could be assigned, but we now trace it to the absorption into the bodies of the sufferers of typhoid poison introduced from without. We are now completely alive to the important results produced by the absorption from the intestinal canal of poisonous matters, such as typhoid germs, arsenic, or strychnine introduced into it from without. But perhaps we are not yet sufficiently alive to the important results produced by the absorption from the intestinal canal of substances generated in

it by fermentation or imperfect digestion We recognise the danger of breathing gas from a sewer, but probably we do not sufficiently realise that noxious gases may be produced in the intestine, and, being absorbed from it into the circulation, may produce symptoms of poisoning. And yet we know, from recorded observations, that such is the case, and that one at least of the chief components of sewer gas, viz., sulphuretted hydrogen, may be produced in the intestine. This gas, which is so readily recognised by its smell resembling rotten eggs, was found by Dumarquay[1] to be very quickly absorbed indeed from the intestine when injected into the rectum, and to be quickly excreted from the lungs, sometimes appearing to produce, during its elimination, some inflammation of the trachea and bronchi. This was especially the case when small quantities were injected, and it seems not improbable that the production of this gas in the intestine may have something to do with the bronchitis which is not unfrequently observed in connection with digestive disturbance. In cases of indigestion this gas seems to be not unfrequently formed, because persons often complain of the taste of rotten eggs in the mouth or in the eructations. Even in such small quantities it is not improbable that it may exert a deleterious influence both upon the nervous system and upon the blood, for it is a powerful poison, in its action somewhat resembling hydrocyanic acid, though not so strong. It destroys ferments, and robs the blood corpuscles and the seeds and roots of plants of their power to decompose peroxide of hydrogen; and as this faculty seems to be closely associated with the processes of life, the sulphuretted hydrogen may be regarded as a powerful protoplasmic poison. Upon plants it has a curious action, differing very markedly from sulphurous acid. When plants are exposed to sulphurous acid, the leaves shrivel up, wither, and fall off, but if the plant be now removed from the noxious influence of the gas, and placed under favourable conditions, it will recover, and send out fresh shoots. But if it be exposed to the action of sulphuretted hydrogen, the leaves, instead of shrivelling, simply begin to look flaccid, and droop. This seems, at first sight, to be a less deadly action than that of the sulphurous acid, but when the leaves have once begun to droop

[1] *Comptes Rendus*, ix. p. 724.

in this way the plant is dead, and does not recover when removed from the action of the gas. This gas is rarely generated in the intestine in such a quantity as to give rise to symptoms of acute poisoning, but it has sometimes this effect. A case is recorded by Senator[1] in which a strong and previously healthy man became affected with a slight gastro-intestinal catarrh in consequence of some error in his diet, and on the second day afterwards he had frequent eructations, smelling strongly of sulphuretted hydrogen. At the same time he suddenly became collapsed, pale, giddy, and with a rapid, small, compressible pulse. This lasted for 1½ to 2 minutes, and then passed off. The urine which he passed shortly afterwards contained sulphuretted hydrogen. On the same day he had a second attack of a similar sort, and then, the bowels having been opened, he recovered completely. Nor is sulphuretted hydrogen the only gas which may be formed in the stomach. Marsh gas is sometimes formed there too, and in an exceedingly interesting case recorded by Dr. Ewald,[2] the quantity was so great that it first attracted the patient's attention by taking fire as it issued from his mouth while he was lighting a cigar. In this curious case the formation of gas alternated with the production of a great quantity of acid fluid in the stomach, which led to vomiting, or, as the patient himself expressed it, sometimes his gas factory and sometimes his vinegar factory was at work. It is possible that this gas may be formed in small quantities in many more cases than has hitherto been suspected, but its absorption does not seem to have anything like the same deleterious action as that of sulphurated hydrogen. Nor was the acetic acid which was found by chemical analysis to exist in the acid secretion of the stomach in this case likely to be productive of any injurious effects after its absorption. But butyric acid, which is sometimes formed in the stomach in other cases of indigestion has been shown by O. Weber, to be a powerful poison acting chiefly on the nerve centres.

It seems probable, however, that the substances, both gaseous and solid, formed in the stomach and absorbed from it, are upon the whole less poisonous in cases of indigestion than those which

[1] *Berliner Klin. Wochenschr.*, 1868, No. 24.

[2] *Reicherts und Du Bois Reymond's Archiv.*, 1874, p. 217.

are produced lower down in the intestinal canal. We often find that patients are affected with severe gastric disorder without any affection of the nerve centres beyond the weakness produced by the inability to digest food, while in many persons the mere omission to evacuate the contents of the bowels at the usual time will lead to a headache in the course of the day. No doubt such a headache as this may be due, to some extent, to the nervous irritation caused by the presence of the fœces in the intestine, but it seems quite possible that it is also due to the absorption of some of the fœcal matter itself. Nor do we at present know what effects are produced by the absorption of the various digestive juices themselves. That such absorption takes place there can be little doubt. It has been demonstrated in the case of the bile, which is absorbed with great rapidity from the intestine and re-excreted by the liver, so that it does not pass into the general circulation at all. But what becomes of the other digestive fluids, and the ferments they contain? The pepsine finds its way in minute quantities through the liver, and has been discovered in various tissues of the body and in the urine. This, however, matters but little, for it cannot act upon the tissues themselves, inasmuch as they possess an alkaline reaction. But the case must be somewhat different with pancreatine, and if pancreatic fluid be absorbed from the intestine and pass through the liver unchanged, we should expect that it would have a very powerful action upon the tissues throughout the body, because there appears to be no reason why it should not act upon them just as it does upon the food in the intestine itself. It seems not at all unlikely, then, that the liver has got another function besides those usually assigned to it, viz., that of preventing the digestive ferments from reaching the general circulation so as to act upon the tissues. Now we do find in the liver itself and in the bile a ferment having the same diastatic power as the pancreatic juice, but it does not appear in such quantities as one would expect if the whole of the pancreatic ferment were simply re-excreted by the liver along with the bile, and as we have no evidence that the ferment is destroyed during its action in the intestine, we are naturally led to think that it may undergo a change in the liver, the converse of that which it undergoes in the pancreatic gland during the process

of secretion. In the pancreas itself we have no ready formed ferment, but we have a ferment-forming substance, which has recently become known under the name of zymogen, given to it by Heidenhain, but the writer heard it described by Kühne in his lectures on physiological chemistry delivered at Amsterdam in 1869. I quote verbatim from the notes which I took at the time of his lecture on the pancreas. "Glands which have no action on fibrine can be made active by digesting in very dilute acid and then neutralising or alkalising; there seeming to exist a ferment-forming substance in the pancreas." During digestion this ferment-forming substance or zymogen splits up and yields free ferment, and it seems not improbable that it is in the liver that this very ferment, after its digestive work is done, becomes again converted into the ferment-forming substance which may circulate throughout the tissues without doing them any injury.

Whether this be the case or not, however, with regard to the ferments of the gastric, pancreatic, and intestinal juices, all of which must pass through the liver before they reach the general circulation, there can be no doubt that the products of intestinal digestion do undergo very marked changes indeed in the liver, as is shown by the formation from them of very large quantities of a new substance, glycogen—a substance which is not contained in the products of the gastric and intestinal digestion which reach the liver, and yet which is of the highest importance for the nutriment of the body. Under ordinary circumstances, nearly the whole of the sugar formed in the intestine and absorbed from it, is arrested in the liver, so that very little passes into the general circulation and appears in the urine, although even in healthy persons traces of sugar are excreted by the kidneys. Under exceptional circumstances, however, sugar may pass through in considerable quantities, as, for example, when the individual takes, on an empty stomach, a large quantity of syrup. However healthy his organs may be, sugar will then appear in the urine. The same is the case in regard to albumen. Usually, the whole albuminous constituents of our food are so transformed in the stomach, intestines, and liver, that no albuminous substances of the kind which can pass through the kidneys get into the general circulation. But if one takes such a quantity

of eggs as to completely overtask the digestive powers, the egg albumen will pass unchanged into the blood, and be excreted by the kidneys.

Other albuminous substances, the products of intestinal digestion, and peptones also, occasionally make their appearance in the urine, as well as egg albumen Even when the processes of assimilation are not so seriously interfered with as in these instances, we observe that products of nitrogenous waste frequently occur in the form of lithates in the urine. An excess of these indicates some pathological condition, even although it may be very trivial. We cannot, indeed, say what the exact condition is, because we find lithates appearing in the urine after violent muscular exertion accompanied by profuse sweating, so that they may possibly represent some of the products of muscular waste; but we also find that they occur in large quantities in the urine after slight indiscretions in diet, although no muscular exertion has been undergone, and in these cases we can hardly do otherwise than regard them as products of the imperfect assimilation of nitrogenous matters which ought to have been eliminated, not in the form of urates, but of urea. Now physiological experiments and observations indicate that the liver is the chief, if not the only part of the body in which urea is formed. This at least appears to be the case excepting in febrile conditions, in which, possibly, the urea may also be formed, to a considerable extent, in the muscles. The old notion, then, which connected the appearance of lithates in the urine with disordered function of the liver, is probably in a great measure correct. There is little or no reason to believe that these lithates are formed in the kidneys. They are, probably, simply separated by them from the blood, and their presence in the urine would therefore indicate their presence in the blood and tissues. Now lithates in themselves do not appear to have any particularly injurious effects, either upon the nervous tissues or the muscles, but as their presence indicates deficient assimilation, they may be accompanied by other substances which have a much more pernicious action, just as there are many bad smells which, *per se*, though very disagreeable, have no marked poisonous action, while other very poisonous substances have

[1] Brunton and Power, *Bartholomew's Hospital Reports*, 1877, p. 283.

comparatively little odour. Yet the disagreeable odours which accompany sewer gas, although perhaps not always dependent upon its poisonous constituents, warn us of the presence of gases which may be intensely poisonous. Nevertheless, just as the poisonous gases may be present without any disagreeable smell, so we may have substances circulating in the blood which have the most injurious effect upon the nerve centres, without the presence of urates in the urine.

The importance of the functions of the liver in reference to assimilation is now generally recognised, although for a long time this, the largest gland in the body, was considered to have no other office than simply to secrete bile. Although the bile is useful in digestion it is not of primary importance in this process; but its proper secretion is probably associated very closely with the assimilative functions of the liver, and if the biliary secretion does not take place properly we can hardly expect the assimilation to be perfect.

The greatest care appears to have been taken in the construction of the liver to prevent the bile from coming in contact with the blood, the ultimate radicals of the bile ducts or biliary capillaries being placed as far from the blood capillaries as the structure of the liver will allow. Notwithstanding this care, the distance between the blood and the bile capillaries is small, though it is sufficient, under ordinary circumstances, to prevent the absorption of bile into the blood. But whenever an obstruction takes place to the exit of bile, and the pressure of bile in the biliary capillaries increases, an absorption of this secretion occurs. Bile is secreted under very low pressure, and a very slight increase in this is sufficient to cause re-absorption. Such an increase as would not materially affect the secretion of other glands, such as the salivary gland, is sufficient to prevent the exit of bile through the biliary ducts, and cause its re-absorption into the blood. The excretion of bile is greatly aided by the pressure which is exerted upon it by the movements of the diaphragm during respiration, and, indeed, so low is the pressure under which the bile is secreted that, but for the assistance given by the respiratory movement, it would just barely find its way into the duodenum. Although we are accustomed to say "As bitter as gall," according to my own observations fresh

human bile is not bitter. When it is thrown up in consequence of indigestion it is intensely bitter. On one occasion, when making experiments with digitalis, I had taken in the course of two days one grain of the pure alkaloid, and brought on symptoms of poisoning, with intense vomiting. During this I brought up a quantity of bile of a golden-yellow colour, and without the least trace of bitterness. This circumstance struck me as being so peculiar that in my published results I hesitated to call it bile, although I did not see what else it could be.[1] But when it remains long in the gall-bladder it undergoes changes, and in some cases of vomiting that I have seen the vomited matters have been of a bright grass-green colour. When examined, also, after death, the bile in the gall-bladder is not unfrequently found of a dark colour, and the same is probably the case when it is retained in the gall-bladder for any length of time during life. How the Greeks arrived at the notion of giving the name "Melancholy," *i.e.* black bile, to depression of spirits, we do not quite know, but certain it is that depression of spirits is very often associated with indigestion, and, moreover, that the form of indigestion with which we find depression of spirits associated, is not so much gastric as intestinal, or, more probably, hepatic. According to Herbert Spencer, we require rapid evolution of nervous energy in order to have exhilaration of the spirits, and depression of nervous energy is associated with melancholy. Now the effect of bile acids circulating in the blood, as shown by physiological experiments, is to depress the reflex function of the spinal cord, the functions of the brain also, producing drowsiness ending in coma, and also weakening the circulation by paralysing the cardiac ganglia.[2] Such a combination of actions is just the one required by Mr. Spencer's hypothesis to produce melancholia, and here we find ancient notions joining hands with modern science.

(*To be continued.*)

1 Brunton *On Digitalis*, p. 67.

2 *Vide* Wickham Legge, *Bile, Jaundice, and Bilious Diseases*, pp. 207, 216, 217.

A SUMMER IN ITALY.

BY DAVID YOUNG, M.D., FLORENCE.

III.

BEFORE entering upon the consideration of the suitability of Abetone as a summer residence, a brief reference to a few of the main characteristics of the climate of Italy generally, and their influence upon disease, may help us to a clearer apprehension of those conditions which would be likely to constitute a healthy Summer Sanatorium within its boundaries, as well as enable us to select with greater certainty those invalids and convalescents most likely to derive benefit during a summer sojourn. One of the first things which strikes an English physician beginning practice in Italy is the difference, which meets him on the very threshold of his work, between the class of cases he has now to deal with, and those he had been accustomed to treat in England or elsewhere with a similar climate. Instead of the great bulk of his patients being what are commonly called *chronic* cases, he now finds that for one case so named, he may have as many as six or eight cases of *acute* disease. Perhaps these figures rather exaggerate the relative numbers of acute and chronic cases among *forestieri* recently come to the country, but they are pretty near the truth as regards Italians and foreign residents who have spent some years in Italy.

The next thing which not only *strikes* but astonishes and alarms an English physician at the outset of his career in Italy, is the rapidity with which acute diseases run their course, especially such affections as rheumatic pericarditis, pneumonia,

bronchitis, and enteritis. Another less alarming but not less important truth slowly dawns upon our medical brother, and that is, that among his chronic cases, the majority appear to be hysteria, neuralgia, and some other unimportant disturbances of the nervous system. With these facts before us, it seems clear that chronic diseases either originate much less frequently in Italy than in England, or, if they occur as frequently, they give so little trouble, that the aid of the physician is seldom sought for their relief. Or it may be that both of these conditions co-exist, and that chronic disease is not only less frequently seen in Italy than in England, but also that it occurs under less dangerous types, and is less hurtful to the general health. This is a subject beset with many difficulties, and it is not easy to get information of such a nature as would throw light upon it. If it could be proved that chronic disease, especially of a degenerative type, did really exist to a much smaller extent in Italy than in England, it might be reasonably inferred that the climate of Italy would prove helpful in the cure of such cases. From very insufficient data in the form of statistics and from my own experience, now extending to a period of nearly eight years, I will try to find answers to the two following questions.

First. Is there any evidence to show that chronic disease is less frequent in Italy than it is in England, and that it is generally speaking of a less dangerous type?

Second. Is there any evidence to show that the climate may have some influence in contributing to this result?

A few years ago Dr. King Chambers published some statistics comparing the death-rate in several well-marked diseases, in two large Italian hospitals—those of Genoa and Milan—with the death-rate in the same diseases in St. Mary's, London. These statistics further included the number of admissions, apart from the death-rate. From these tables Dr. Chambers drew the following conclusions:

(1.) "That there is a remarkable excess in the mortality from chronic diseases in London over that of an Italian town similarly circumstanced."

(2.) "That this excess in mortality is united to and probably arises from an excess in prevalence."

(3.) "That this excess is most striking in diseases where a

tendency to degeneration of tissue is the most marked, and the most directly the cause of the disease."

Since the publication of these tables I have examined every statistical issue within my reach, and find that the conclusions arrived at by Dr. Chambers, are strengthened and corroborated by the experience of succeeding years. My own practice points strongly in the same direction. Taking a cursory view of the past five years, the following figures may be taken as a fair average of the cases treated by me during that period:

Chronic Diseases.		Acute Diseases.	
No of Cases	Name.	No of Cases	Name.
31	Bronchitis.	274	Bronchitis.
13	Dropsy from diseased kidneys.	165	Pneumonia.
19	Dropsy due to heart or lungs.	98	Pleurisy.
5	Dropsy due to liver.	26	Pericarditis.
17	Pulmonary consumption.	58	Rheumatism.
11	Chronic affection of brain.	21	Meningitis.
5	Aneurism.	75	Enteritis.
5	Waxy liver.	19	Gastritis.
4	Cirrhosis of liver.	217	Diarrhœa.
13	Aortic disease.	169	Dysenteric diarrhœa.
11	Mitral disease.	21	Apoplexy.
4	Hypertrophy and dilatation.	341	Fevers, including intermittent, continued typhoid, and scarlet.
17	Atheroma.		
23	Diarrhœa (ch.)		
159	Neuralgia.	37	Erysipelas.
143	Hysteria.	53	Diphtheria.
19	Epilepsy.	21	Laryngitis.
		74	Tonsilitis.
		9	Infl. of spinal cord.

The above examples of well-marked and ordinarily met with cases of disease, taken from my own practice, afford fair presumptive evidence in support of the statement just made, that acute disease occurs in a far higher relative proportion in Italy; and it would not be difficult to prove from the statistics of any of our large hospitals in England that cases of chronic diseases occur in a much higher relative proportion there than with us in Italy. This argument receives further strength from a closer examination of the above tables. The majority of the cases of chronic affections given above, especially those of the

heart, liver, and kidneys, occurred in *forestieri* recently come to Italy, whereas the cases of neuralgia, hysteria, and epilepsy, nearly all occurred among Italians and old residents in Florence. On the other hand, in the case of the acute diseases, they occurred in all classes alike, and were pretty much scattered over both foreign visitors and natives of Florence. Probably enough has been said to indicate the existence of an important subject, which may assume a more definite practical shape if other workers in Italy will give to the profession the results of their experience.

The second question now demands a little attention. What is the cause of this difference? Has climate anything to do with it?

The greater prevalence in England of diseases of a degenerative type is not confined to any particular section of the community, save in those cases where certain occupations predispose to certain well-marked ailments, but to a greater or less extent is found to pervade all classes of society, and may thus reasonably be supposed to be due to the effects of climate and habits of life of the people. And as climate in every country controls not only the habits of the people but dictates in a great measure the nature of their food, these two subjects are intimately bound up together, and, as we shall hereafter see, are potent both in the causation and cure of disease. Just as in England no class is exempt from the dangers of the particular type of disease now occupying our thoughts, so in Italy no class specially enjoys the privilege of immunity from them,—it remains the boon of all classes alike. Is Italy then a healthier country than England? No! On the contrary, its death-rate is much higher, but the mortality is due to diseases of an exactly opposite type to those which destroy life in England. Instead of torpor of the digestive and absorbent processes, obesity with or without anæmia, atonic mucous membranes both in chest and bowels, and a feeble circulation leading to grave destructive changes, we have a tendency to activity in every organ and in every vital process, as evidenced by health regained and maintained upon a lighter diet, less, even little or no alcohol, and fewer hours for sleep than are required in England. The blood is highly arterialized; the circulation, instead of being feeble and slow, is active and

strong, and the renewal to more vigorous life in those morbid states of *constitution* marked by degenerative tendencies constitutes one of the most powerful effects of the Italian climate. What are the elements in the climate which produce these highly important results? In answering this question we have not only to consider the quality of the air, but also the character of the food which the climate suggests as most suitable for the inhabitants of the country. The three main elements in the Italian climate looked at from a physiological point of view are:

(A) Dryness.
(B.) Warmth.
(C.) Abundance of sunlight.

The geographical contour of the country causing it to be to so large an extent surrounded by a sea whose waters exhibit an extraordinary degree of *saltness* is the main cause of the general dryness of the atmosphere, which in some places gives a daily average of about *seven degrees* of difference between the *wet* and *dry* bulbs during the summer months. The result of this great degree of saltness of the water of the Mediterranean is manifested in the readiness with which the sea absorbs moisture from the air, and the tenacity with which it holds it, being much less disposed to yield it back to the atmosphere under variations of temperature than seas in more temperate latitudes. Under the same influence the temperature of the Mediterranean itself is more equable,—indicating at a depth of four feet on the Leghorn coast about 72° Fahr. in summer, and the atmosphere surrounding it has a lower degree of hygrometric saturation and is at the same time less rainy. Even during rainy weather there is much less depression felt than in England, and unless in exceptional places near mountain gorges, as for example Florence, there is not the same combination of wet weather and cold winds which imprison for several weeks at a time so many invalids in our home lands.

(B) The clearness and equal warmth of the air throughout Italy is due no doubt in a great degree to the proximity of the Mediterranean, whose large body of water is of a high and little-varying temperature. We have known bathers swimming far out to sea and remaining two or three hours in the

water at a time without the slightest inconvenience. During the month of September I took a bath at Livorno every day, and never remained in the sea less than an hour. The influence of this great body of water so closely intermingled with the land is to preserve the temperature of the atmosphere from those great variations which are so generally felt in countries like England. This influence is not felt in all places alike, but everywhere throughout the country the invalid can with little trouble find spots where he would experience in mid-winter a climate superior to that of an English summer. Travellers too frequently forget what they have come to the country for,—leaving England to avoid cold and dampness, they often take up their abode in a sunless street in a large city, spend much of their time in cold unaired churches or picture galleries, from which the sun is carefully excluded, instead of living in the open air, enjoying the sunshine and the dry genial atmosphere at a season when they dare not venture out of doors were they at home. Such is the evenness of the temperature that no one, if able in any way to take exercise, need lose the benefit of being a great deal in the open air.

(C.) The number of sunny days in Italy is far larger than in England, and unless during the early autumn and spring, when rainy days are apt to be frequent, there is scarcely a day that the sun does not make his appearance, and often for weeks together not a cloud is seen, but everywhere the landscape is bounded by clear blue sky. The rapid tanning of the skin is an evidence that the chemical actions of the body are intensified, and the effects of the sunlight upon the physiological processes also conduce to the well-being of the economy.

These are the three elements which appear to me to be the chief agents in rendering the climate of Italy specially useful in all those affections which have this one feature in common—*feebleness of blood circulation with a tendency to chronic destructive change of tissue.* A moment's reflection will make the reason apparent. In regard to the *mildness* of the climate, it enables the invalid to spend much of his time in the open air. Instead of being shut up for days or

even weeks, at a time, in rooms where the air is close and impure, he is able to have his daily walk or drive, and in many cases can sit out of doors for several hours during the day. Under such circumstances, rapid renewal of tissue takes place; the circulation being improved supplies the material for such repair. On the other hand, the *dryness* of this mild air renders the mucous membranes more healthy, chronic discharges from their surfaces slowly disappear, and they soon regain their tone and once more become active in the work of respiration and digestion, while the action of the sun, especially of the sunlight, is no less potent in the various conditions of anæmia. There is one circumstance which frequently causes anxiety to new-comers in Italy—*the want of sleep.* Almost every one goes through some experience of this kind, and invariably a brief sojourn sees this sleeplessness disappear. No drugs need as a rule be resorted to, and the traveller, if he is sensible and takes matters patiently, will not only find that his sleep returns, but that he can do with very much less sleep than in England, and that after what he would call a *sleepless night* he rises more refreshed than he used to do at home after a longer and pro-founder sleep. This is an important matter, and ignorance on the point has more than once caused needless alarm to travellers.

The question of diet is also of considerable importance, and though too frequently disregarded by strangers, it cannot be too earnestly insisted on, that as a general rule the nearer our food approaches that of the natives of the country in which we happen to be, the safer it is and the more conducive to health. This remark also applies to the subject of wine. The proximate principles of an Italian dietary should include much less of the nitrogenous elements in the shape of *butcher's* meat than an English one. Bread, maccaroni in every form, abundance of fruit and vegetables, salad with pure olive oil, should bulk relatively more largely in an Italian than in an English dietary. The longer the residence in the country the easier it becomes to conform to this change. Recently, while visiting a friend in La Valle Benedetta who has long been engaged in extensive engineering works in Italy, I asked him in regard to his experience on this point among able-bodied labourers. He told me that during some of his largest contracts he had an

amount of work done daily that could not have been surpassed by English labourers, and that though idleness was a frequent characteristic of the Italian workman he had hundreds of able men who did an amount of work which astonished him. And what was the ordinary diet of these working men?

For Breakfast (8.30 A.M.).—Dark bread and a tumbler of water.

Luncheon (mid-day) —Same as breakfast.

Supper (7 P.M.).—Bread fried in olive oil with garlic or onions and water to drink.

The evening meal varying, garlic and onions with some other vegetable or fruit during summer, but scarcely ever including *butcher's* meat or wine.

Although Italy is a wine-growing country, wine does not form so staple a part in the dietary of the labouring class as is generally supposed. Among the *Contadini*—the agricultural labourers,—it generally does; but among many other labouring classes, *e.g* railway labourers and ordinary working men of a low class, it does not. Among the *Contadini*, bread is rare, its place being supplied by *polenta* and *necci* made respectively from Indian corn and sweet chestnuts.

The red wine of the country, which is refreshing and light, is, generally speaking, the best wine for strangers; unfortunately, however, passers through the country seldom get it so good as residents do. Strong wines of all kinds are hurtful, and speedily make their effects known in great discomfort if nothing worse.

With the foregoing facts before us we are now in a better position to discuss those conditions which are essential to make a Summer Sanatorium in Italy comfortable and healthy. The very conditions which exist and render the winter climate so useful to a large class of our suffering fellow-men are just those conditions which, under certain circumstances, would become hurtful during the summer months, and make a stay in Italy at that season almost impossible. This is especially the case as regards the high temperature of the summer and a powerful, almost a tropical, sun; while it not unfrequently happens that places which afford a sufficiency of protection from heat and the sun's rays, do not at the same time furnish the important element of *dryness* of atmosphere. Such a place for example is the Bagni di Lucca. This picturesque village town is only a

few hundred feet above the level of the sea, and lies in a narrow valley richly wooded with chestnut-trees. The valley is so narrow at one part that the rocks almost overhang the houses below, while through the valley runs a fair-sized mountain stream. Now in this beautiful spot much has been done to supply one or two good shady walks in the vicinity of the village, so that while there is a fair amount of shade, the heat in summer is great and the atmosphere at and after sunset is more or less damp. Other places, such as Gavinana and Cutigliano, situated more than 2,000 feet above the level of the sea, afford a dryer and a cooler air, but scarcely any good shade is found in either—certainly not so ample as at the Bagni di Lucca. There was always some element awanting to complete the several conditions necessary to make the resort a pleasant summer residence alike for the invalid and the healthy in search of a more invigorating air. Having thought much on the subject, I began to look about for such a place, and three years ago, during a brief visit to Abetone, it seemed that I had found it. Last summer a stay of ten weeks, and a further stay of seven weeks this summer, have confirmed the conviction that in Abetone there is every condition necessary to make it—a cool, bracing, and pleasant summer residence.

Reviews.

Antiseptic Surgery. By WILLIAM MACCORMAC, M.A., F.R.C.S.E. & I., M.Ch. Hon. Caus., Surgeon, and Lecturer on Surgery, St. Thomas's Hospital, &c. London: Smith, Elder, and Co. 1880. 8vo., pp. 286.

THE first hundred pages of this book, containing the discussion on Antiseptic Surgery, held at St. Thomas's Hospital during December of last year, require no further criticism than that which the discussion has been already subjected to. Mr. MacCormac has made this discussion a kind of basis on which he has built an excellent, though short, treatise on Lister's antiseptic method. The theory of wound-inflammation is clearly stated, and reason is shown for the employment of the most thorough antiseptic treatment. A detailed account is given of the various antiseptics, at present in common use, and of the mode of preparation of many dressings But the most interesting portion of the book is perhaps the last chapter, in which rules or suggestions are laid down for the antiseptic treatment appropriate to certain injuries and operations, and an insight is thus afforded into what may be expected in the immediate future of antiseptic surgery. That by its means many operations have been rendered possible, which formerly would scarcely have been countenanced, cannot be doubted; but we cannot repress a lurking fear lest the marvellous results attained by those who have been well-trained and are thus expert in the management of antiseptic wounds, should lead the ignorant or the unwary to attempt feats which practice, and thought alone can render safe. For example, it must not be forgotten that a simple fracture of the patella is an accident practically devoid of danger. When therefore it seems possible that this accident may in future be habitually treated by opening the knee-joint, washing it out, and wiring the two fragments of the broken bone together, we must confess to a feeling of horror, especially as rumours are occasionally heard that the opening of a large joint by the greatest exponents of Listerism has been followed by untoward consequences.

We are a little astonished that Mr. MacCormac should see fit so often to refer to the opinions and results of German surgeons, and to pass over those of English surgeons which are equally worthy of notice.

The Student's Manual of Venereal Diseases. By F. R. STURGIS, M.D., Clinical Lecturer on Venereal Diseases in the Medical Department of the University of the City of New York, &c. New York: G. P. Putnam and Sons. 1880. Fcap. 8vo., pp. 196.

AN excellent manual, short, for the most part clearly written, and thoroughly practical throughout. It may justly be recommended, not only to the student, but to all those who are frequently called upon to treat venereal affections, for many useful rules regarding diagnosis and treatment may at once be found in it laid down with brevity and precision. The teaching is, on most points, that of the English schools, but differs from their teaching in one important respect, on the employment of mercury in syphilis. Most English surgeons are in the habit of administering mercury as soon as a clearly-marked "initial lesion of syphilis" is discerned, but Dr. Sturgis, in common with Bumstead, regards the administration of mercury before the secondary symptoms have appeared, not merely as useless, but as actually prejudicial, because, so far from preventing the occurrence of secondary symptoms, it retards their outbreak and thus tends to mislead the surgeon and induce a false sense of security.

Practical Lithotomy and Lithotrity; or, An Inquiry into the Best Modes of Removing Stone from the Bladder. By SIR HENRY THOMPSON, F.R.C.S., Surgeon Extraordinary to His Majesty the King of the Belgians; Emeritus Professor of Clinical Surgery and Consulting Surgeon to University College Hospital, &c. Third Edition, considerably enlarged. London: J. and A. Churchill. 1880. Demy 8vo. pp. 304.

THE interest in the third edition of this work centres in the eleventh chapter, on "Lithotrity at a Single Sitting;" and we may confess at once that we are not thoroughly satisfied with this chapter. The small meed of praise bestowed on Professor Bigelow for his brilliant suggestion; the condescension with which Sir Henry Thompson says that his "mind was already prepared by past experience to receive it favourably;" and the manner in which the author makes use of Bigelow's instruments (slightly modified) and at the same time condemns them, will be very gratifying to the impartial reader. In truth, Professor Bigelow's

method, *and the instruments he has invented,* are not unlikely to produce a complete revolution in the teachings which have hitherto prevailed on the subject of Lithotrity. It has already been proved in America and in this country that stones of considerable size may be removed at one sitting with the happiest results, even in men of advanced age, and in those whose constitutions appeared but little adapted to bear the strain of such an operation; and the question which now occupies the minds of the most distinguished lithotritists is whether the proceeding of Bigelow should be universally employed for the removal of stone in adults. Sir Henry Thompson's experience of the operation extends to thirty-five cases in which he has performed it without a single fatal result, and almost without mishap; yet many of his patients were very old, and some of the stones were very large. The objections made to the large size of Bigelow's instruments appear to us untenable; and the statement that the "extra work necessary to be performed at a single sitting, especially demands a practised hand to do it safely," although it may be true, at present requires to be proved. That the bladder will bear with impunity much rougher handling than Sir H. Thompson appears to believe is proved by the work of other operators, bolder, if perhaps, less skilful than himself. We are ourselves aware of cases in which the operation was continued for upwards of an hour before complete removal of the stone was effected, and in which the patient recovered without a bad symptom. Nevertheless Sir Henry Thompson is probably quite right in exercising caution, and while we should not dare to recommend to so admirable an operator a little more boldness, we have no hesitation in recommending a little more generosity in acknowledging the value of a proceeding which is likely to reflect the greatest credit on Professor Bigelow, and through him on American surgery.

Medicinal Plants; being Descriptions, with Original Figures, of the Principal Plants Employed in Medicine, with an Account of their Properties and Uses. By Robert Bentley, F.L.S., and Henry Trimen, M.B., F.L.S. Parts 38 to 42. London: Churchill.

These parts contain, in addition to the subject-matter, a preface, systematic list of contents, list of additions and corrections, and index to the whole work. Amongst the plates we notice one of the *Aloe Succotrina*, but, despite its name, it does not seem at all certain that this is the source of socotrine aloes. We observe, also, a plate of the *Aloe Spicata*, which is the source of Cape aloes, now so abundant and important an article of commerce, and this species is here figured for the first time. As

illustrating the usefulness of the work to others than residents in this country, we find, close together, plates of the *Chondrus crispus*, or Irish moss, and the *Graciliria Lichenoides*, or Ceylon moss, a plant which serves in India as a food for invalids in the same way as Irish moss in this country. For both are given useful directions regarding the method of preparation.

This work, which is now complete, has fulfilled the high promise of its first parts. As the authors themselves observe, some inequalities of treatment are to be found in it, some plants being slightly noticed, while others are dealt with at undue length, but this was almost unavoidable, as the differences have chiefly resulted from the varying interest taken in remedies during the publication of the work. It was originally intended to serve as a guide to the pharmacopœias of Britain, India, and the United States. All the plants in the British pharmacopœia have been figured and described, and most of those of the pharmacopæias of the other two countries mentioned. The work also includes other species in common use, though not officinal in this way, and some of our most poisonous indigenous plants. The text relating to each plant is divided into two parts; the first being devoted to a botanical history of the plant, and the second to its composition, properties, and uses. The first of these was written by Mr. Trimen, the second by Professor Bentley, and both appear to have been done in the most satisfactory manner. The work will, we think, prove exceedingly useful, not only as a companion to, and commentary on, the pharmacopœias already mentioned, showing the characters and giving the composition and uses of the plants officinal in those pharmacopœias, but also introducing to the notice of practitioners in each country a number of remedies almost entirely unknown to them, and which may prove of very considerable practical service. The book has maintained its high standard throughout, and without it no medical library will be complete.

Clinic of the Month.

Treatment of Tropical Dysentery.—In treating this disease, Dr. J. H. Courtenay, as a preliminary measure, if the dysenteric phenomena have not displayed themselves in too marked a degree, orders half an ounce of castor-oil with ten or fifteen minims of tincture of opium; the patient to be kept quiet and abstain from all solid and irritating food. This failing to check the disease, absolute rest in the recumbent position must be enjoined, twenty to twenty-five minims of the sedative solution of opium administered, and in twenty minutes afterwards thirty grains of powdered ipecacuanha in an ounce of water or syrup of orange-peel. The patient must then be kept perfectly quiet and abstain from all food, fluid or solid, for two or three hours. If the ipecacuanha is vomited immediately after it has been administered, allow an interval of about half an hour to elapse, and then repeat the full dose again. In the further treatment of the case ten-grain doses of ipecacuanha should be given every six hours until convalescence is established; and when it is, to guard against a relapse, it is a wise precaution to give five or ten grains at bed-time for a few nights. In addition to this treatment a two-ounce starch enema containing twenty to twenty-five drops of sedative solution of opium given at bed-time has an admirable effect in controlling tenesmus and inducing sleep. With regard to nourishment, Dr. Courtenay has never found, in adopting this line of treatment, that the nauseating effect of ipecacuanha produced any alarming intolerance of food; of course, food of the lightest nature, such as beef-tea, chicken-tea, arrowroot, milk, and the like, should only be administered. He thinks the use of stimulants should be dispensed with unless there is extreme exhaustion, and even then they should be given sparingly and extremely diluted. "And now," says Dr. Courtenay, "it will be asked, Does the ipecacuanha treatment never fail, and is it an absolute specific for dysenteric disease? I can unhesitatingly answer, as far as my experience enables me to do so, that in the great majority of

cases it certainly does not fail, and that its effects are often magical; but I have met a few cases where no precautions or varieties as to administering small or large doses of the drug seemed to be able to avert the absolute intolerance of it. Under these circumstances I administered a bismuth-and-soda mixture containing five drops of sedative solution of opium in each dose. I also gave a powder containing mercury with chalk and compound ipecacuanha powder every four hours, and an opiate enema at night. Several writers on the subject say that when this intolerance is present hepatic complications are to be dreaded, but happily in the cases I have alluded to no such difficulties had to be encountered, and they quickly yielded to treatment; but I consider that when a patient suffering from dysentery is unable to take ipecacuanha his chances of recovery are seriously lessened by such inability. My utmost expectations will be fully realised if this very imperfect outline of the treatment of tropical dysentery enables some new-comers to grapple with a disease that admits of no parleying with, and if the re-opening of the subject is sufficient at least to arouse the attention of those who feel a great difficulty in yielding up preconceived ideas." (*Lancet*, July 17, 1880.)

The Virginian Prune.—Few drugs have a wider repute in the United States, and have failed more completely to gain a position in the practical therapeutics of this country, than the Virginian prune bark. In spite of the recommendations of Dr. Clifford Allbutt and others, it is still almost unknown to the bulk of practitioners. An instructive and fairly complete account of the history and uses of the drug, by Dr. Van der Espi, has recently been published in the Belgian *Journal de Médicine*, and some of the facts there mentioned may be interesting to our readers. The tree grows in all the States of the Union, but it attains the largest size in the south-western States. Everywhere in the northern States it is reputed one of the most useful of indigenous remedies. According to Proctor, the bark yields a volatile oil, of pale-yellow colour, which has the odour of bitter almonds, and contains hydrocyanic acid in such quantity that two drops will kill a cat in five minutes. The prussic acid does not exist as such in the bark, being formed, as in bitter almonds, by the action of emulsin on amygdaline. It contains also tannic and gallic acid, starch, resin, salts of lime, potash and iron, a fatty matter, woody fibre, and a red colouring matter. These facts have been confirmed by the author of this memoir, and he has further proved that the amygdaline exists in the Virginian prune bark in a crystallisable form. Its quantity is, however, very variable; it is different in each kind of bark; that of the root contains more than that of the trunk,

and the latter more than that of the young branches; it varies also with the age of the tree, with the time of year at which it is collected, with the age of the bark, and with the mode in which it is preserved. The contact of moisture causes the emulsin to act upon the amygdaline, and the bark is therefore best preserved in zinc cases, hermetically closed. The red colouring matter he finds to be analogous to the soluble red substance found by Pelletier and Caventou in the cinchona bark.

A gramme of the powdered bark has a taste which is at first astringent and afterwards bitter, and resembles that of prussic acid. It causes a sensation of warmth at the epigastrium, and appears to have a tonic (or stimulant) action, increasing the general sense of energy. Diminished sensibility, retardation of the pulse, and lowered temperature follow, due, no doubt, to the prussic acid which is formed. Strong doses, taken several times a day, were found to reduce the pulse from 65 to 50. When the dose exceeds three grammes, it causes a sensation of fulness at the stomach, nausea, and diarrhœa. Larger doses cause dangerous symptoms, due to the hydrocyanic acid, which appears to combine with the hæmoglobin of the blood.

The value of this substance in medicine appears to depend chiefly upon the constituent tannin and prussic acid, and it is said to be useful in debility of the digestive organs, general debility accompanied by local or general irritation, in the convalescence from local inflammations, in acute febrile diseases, and in painful affections of the stomach. It has been recommended in intermittent fever. Tannin has been held in high repute in the treatment of ague (Chancerel, Pezzoni), and so also has prussic acid in the form of bitter almonds. The prune bark is much used in America in the treatment of phthisis; it is said to have a marked effect on the pyrexia, on the cough, on the expectoration, and on the night-sweating. It has been used by Van der Espi with success in whooping-cough. Hydrocyanic acid is an old remedy in this affection. In this country the bark has been used chiefly in heart disease, and it is said to be of very marked value as a cardiac sedative, most useful in the cases in which digitalis is not well borne. In bronchitis the sedative effect of the prussic acid on the cough, and of the tannin upon the expectoration, is said to be valuable. It has been recommended as an external application to ulcers and as an application to the eye in catarrhal ophthalmia. In the latter Van der Espi asserts that it is much more useful than simple tannin. These are the chief alleged uses of the drug, but the list does not by any means exhaust the class of diseases in which it has been recommended, and which comprehends a large proportion of known maladies. The bark is administered as a

powder, in an infusion, a syrup, or a tincture. By evaporating the tincture, an extract is obtained which the Americans call prunin or cerasin, the dose of which is from two to ten grains. Possibly the reason why it has been so little employed in this country is the deterioration of the bark before it reaches us. (*The Lancet*, July 17, 1880.)

On the Blood in Anæmia.—Dr. Joseph Hunt makes the following observations on this subject:—"By the hæmacytometer and hæmoglobinometer we are unable to compute the amount of corpuscles and hæmoglobin in the blood, but only the proportion which these bear to the serum.

"Greater experience has fully convinced me that our estimate of the number of white corpuscles is considerably above the mark. The maximum number has been stated as ·3 per hæmic unit, represented by two squares of Dr. Gowers' hæmacytometer —that is, 1,500 corpuscles in the cubic millimetre of blood, but I believe that they very seldom exceed ·2 per hæmic unit, and more frequently than not fall even below this. The average corpuscular richness of the blood in anæmia, as shown by observations in thirteen cases, all of which were at the commencement of treatment below 75 per cent., is about 63 per cent.—a computation strikingly in accordance with my previously published results, where the average of ten cases was 62 per cent. As before pointed out by Dr. Gowers, myself, and others, the corpuscular richness of the blood is seldom accurately represented by the appearance either of the skin or mucous membranes Not unfrequently have I examined the blood of young girls attending my out-patient room expecting to find a marked diminution in the number of the corpuscles, and, to my surprise, found it normal, or nearly so. Similarly, when, at the commencement of treatment, the corpuscles may be considerably below the average, they regain the normal long before the symptoms have disappeared, and the patient has been restored to health. But though in such cases the corpuscles may be but little affected, the hæmoglobin is very far from being so. In nearly all cases the corpuscles became normal in from two to three weeks, while it takes three or four times that period for the hæmoglobin to reach anything like the usual percentage. For example, out of ten cases which I have charted with great care—observations being made weekly, and each case being so much improved that the patient no longer cared to attend—in only one did the proportion of hæmoglobin exceed 90 per cent., in this case reaching 100 per cent.; while the average attained at the end of the treatment was only 70 per cent. The length of treatment varied from three to ten weeks, the average being six weeks. These facts are in the most striking contra-

distinction to observations made by Hayem. According to him, in anæmia treated by iron the hæmoglobin increases out of all proportion to the corpuscles—so much so that the richness in hæmoglobin may exceed the richness in corpuscles. Notwithstanding my very numerous experiments, I cannot recall to my mind, and certainly I have no notes of, any case in which the richness in hæmoglobin at any period of the treatment ever equalled the corpuscular richness—indeed only once has it come within 10 per cent. of it. In regard to this point, Drs. Baxter and Wilcocks similarly are in opposition to Hayem, and record results very similar in many respects to mine.

"The amount of hæmoglobin at the commencement of treatment, as noted in fifteen patients, averaged 44 per cent, eight of these being 40 per cent. or below. Though, as remarked above, the corpuscles become normal in number long before the hæmoglobin, yet under judicious treatment the latter steadily increases in amount—about the same rate *proportionately* as the corpuscles. Thus, out of fourteen cases in which both the amount of corpuscles and the hæmoglobin were noted at the first visit, the former averaged 79 per cent. and the latter 44, a proportion of very nearly 9 : 5. After a week's treatment the percentage of ten of these was noted as 86 of corpuscles and 51 of hæmoglobin, a proportion of $8\frac{3}{8}$: 5; and after a second week the corpuscles had risen to 95 and the hæmoglobin to 55—that is $8\frac{1}{2}$: 5.

"In occupation these patients were mostly general servants, barmaids, pupil-teachers, shop-girls, dressmakers, and such like; and in age they varied from fifteen to twenty-five years old. In most of them there were hæmic murmurs heard at the base and in the carotids and jugulars; and in some apical murmurs, probably due to a temporary dilatation of the left ventricle, rendering the closure of the mitral valve imperfect, while increased tension in the pulmonary circulation was in many cases indicated by an intensified second sound heard at the pulmonary cartilage. As far as I have seen, hæmic murmurs have been not seldom absent when the corpuscular richness and the amount of hæmoglobin have been much below the normal. This requires further observation, and would be difficult of explanation unless under the supposition that there is a large excess of serum present, which, while it serves to dilute considerably the corpuscles and the hæmoglobin, helps also to maintain the quantity of the blood unaltered, and causes therefore no difference in the relationship between the quantity of fluid and the containing blood-vessels, which would be essential, according to many, for the production of hæmic murmurs.

"I have watched with much interest the relation which the corpuscular richness of the blood bears to the catamenial periods. To do this exactly, of course, is difficult when

patients are seen only once a week, as in most of my cases; but it appears to me that the catamenia generally diminish the number of corpuscles. This diminution is most marked if the blood be examined shortly before the onset of a menstrual period, though it is also found if the blood be examined soon after. This observation has been so frequently made that it cannot be a mere coincidence. Thus, out of twenty-two instances in which the blood was examined within three or four days either preceding or subsequent to the catamenia, in only three was there a continuous rise in the number of the corpuscles, while in four the previous rise was arrested, and in the remaining fifteen there was a distinct diminution either just before or after the onset of the catamenia. The amount of hæmoglobin appears to be less affected by the catamenia, and I have similarly noticed that it is less affected by other disturbing conditions which cause a decrease in the number of corpuscles. In other words, while the rise in hæmoglobin is not so rapid as the rise in corpuscles, it is more steady, and not so much affected by adventitious circumstances.

"The treatment of the various cases differed considerably. In most, in addition to hygienic treatment, iron in some form or other was tried. The old and well-known compound mixture of iron, or Griffiths's mixture, gave as good results as any. The tincture of perchloride of iron was very valuable, and especially so when given in fairly large doses—fifteen to twenty minims. When given in smaller doses, as five minims, it did not effect nearly so much improvement in the blood condition. As a matter of experiment, arsenic (Fowler's solution) was tried in a number of cases by itself; though it occasionally effected a considerable rise in the number of corpuscles, this rise was very unsteady and liable to great fluctuations and relapses. Arseniate of iron, given in doses varying from one-sixteenth to one-third of a grain, frequently much improved the general condition, but did not effect any marked or steady change in the blood condition—a fact easily accounted for by the small amount of iron present in the preparation." (*The Lancet*, July 17, 1880.)

Extracts from British and Foreign Journals.

The Treatment of Asthma.—Dr. William Pepper, of Philadelphia, read a communication before the State Medical Society, entitled "Some Practical Remarks on the Treatment of Asthma." Asthma he considered as including not only the attacks, but also the peculiar tendency to the paroxysms which exists in the interval between them; in the same manner as epilepsy is constituted not simply by convulsions, but by the nerve lesion or disorder that leads to their recurrence. He believed that the essential factor in asthma is "a condition of morbid susceptibility or of actual disease of the nervous filaments supplying the ramifications of the bronchial tubes, and, perhaps, of the thoracic ganglia of the sympathetic." The principal or most common factor associated with asthmatic attacks is bronchial congestion; but the paroxysms may be induced simply by reflex irritation, from indigestible food, for instance, those showing a resemblance in pathology to spasmodic croup. In the treatment the removal of the underlying morbid condition and the palliating of the actual attacks both demand consideration. Two classes of asthmatics had been noticed particularly, the plethoric and the anæmic. The first are characterised generally by sedentary habits and the use of alcohol; and more or less swelling of the liver, sluggish digestion, and high-coloured urine with excess of urates, coexist. The chest-walls are apt to be heavily coated with fat, the heart's action is laboured, and the skin is very susceptible to sudden changes of temperature, or to draughts and damp. Now if in such subjects a tendency becomes established to bronchial congestion, repeated attacks of asthma will readily occur. Bronchial catarrh gradually becomes a more prominent feature, a varying amount of vesicular emphysema is established, and trifling causes will now induce the attacks. Some of the worst cases belong to this group. The second class are poorly nourished and decidedly anæmic. Asthma is readily instituted in such patients, and indeed the tendency to spasmodic nervous affections not rarely precedes

any local bronchial trouble, although bronchial catarrhs are also of frequent occurrence. In these cases phthisis may ensue, but more frequently emphysema (atrophic or hypertrophic) occurs, the heart fails seriously, and the case assumes grave features. Among the principal indications for treatment are: (1) restoration of tone to the skin and the muscles; (2) relief of congestion of the liver and of gastric catarrh; (3) improvement of the power of the heart and of the peripheral circulation; (4) removal of morbid conditions of bronchial mucous membrane, and of the morbid irritability of the nerves supplying the pulmonary tissues; and (5) repairing the vesicular emphysema that has resulted from the asthmatic attacks and the persistent bronchitis. Gymnastic exercises, baths, frictions, inunctions, and the careful hygienic management of the case are insisted upon as essential to successful treatment. Changes of climate, especially from a damp to a dry bracing atmosphere, is recommended as a remedy of primary importance. Where abdominal plethora is marked, the use of mild salines, such as Carlsbad or Bedford water, with an occasional blue pill, is needed. Mineral acids, with quinia and strychnia, are often indicated. In anæmic cases a pill of strychnia, digitalis, arsenic, and iron has been used with advantage, after due attention had been paid to the digestion. Where the heart is embarrassed by local congestions, dry cups to the chest twice a week afford great relief. Associated bronchitis (subacute) requires alkalis, iodide of potassium, and perhaps corrosive sublimate in small doses. In cases of copious muco-purulent secretion the use of copaiba and eriodyction are especially valuable. Spasm of bronchial tubes calls for the bromides in small doses, or a hypodermic of morphia and atropia, but the continued use of sedatives is injudicious. The nitrite of amyl is sometimes palliative. Inhalations of carbolic acid and iodine are beneficial, and Waldenburg's apparatus affords the best means of pulmonary gymnastics, especially to be recommended where the vital capacity is below the average. Where the paroxysm is reflex, a mild emetic is sometimes useful; but due attention to the stomach and the secretions is imperative. Asthma cigarettes, consisting mainly of powerful sedatives and nitrate of potassium, frequently yield relief during an attack, but the writer had obtained excellent results from the following combination given internally:—

℞	Ammonii bromidi . . .	ʒij.- ℈ ij.
	Ammonii chloridi . . .	ʒiss.
	Tr. lobeliæ	fʒiij.
	Spts. ætheris comp. . . .	℥i.
	Syrup. acaciæ	q s. ad ℥iv. M.

S. A dessert-spoonful in water, repeated every hour or two during the severity of the attack. (*The Boston Med. and Surg. Journ*, June 3, 1880.)

Duboisia and its Therapeutic Effects.—A slight degree of poisoning by duboisia produces in man the following phenomena: Dryness of the mouth and throat, dilatation of the pupil, and accompanying it, dimness of vision; when in a more advanced stage it is accompanied by cephalalgia, vertigo, and drowsiness; which may even deepen into a comatose stupor. The pulse is considerably quickened, it may range from 60 to 180 (Ringer.) The skin is covered with a scarlatiniform eruption. Sometimes an extraordinary lassitude may be observed, an uncertainty in talking, and delirium. In the experiments undertaken by M. Fauqué, (*Thèse de Paris*, 1879), a noticeable quickening of respiration was detected in animals, though this was not observed with atropia. The central nervous system is then acted upon: thence come delirium and stupor. In the case of animals subjected to subcutaneous injections of duboisia a marked weakening of the excito-motor power follows. This weakness continues as long as excess of blood to the member, which is being studied, is prevented. In exceptional cases tetaniform convulsions have been observed. The action on the circulatory apparatus is shown by the acceleration of the heart-beat, but this is not observed in frogs. In these animals, contrary to what is produced in the case of dogs, there is a diminution in the heart-beat. The secretion of sweat and saliva is considerably diminished. From this results the great dryness of the mouth and throat observed in men and animals. There should be, according to M. Fauqué, a paralysing action on the excito-sudoral nervous fibres, admitted by M. Vulpian. Finally duboisia causes dilatation of the iris, and paralysis of accommodation, and seems to act by direct paralysis of the motor nerve-filaments of the ciliary muscles and iris. Besides, the action on the iris and the ciliary muscle is exercised independently; the iris remains paralysed longer than the muscle of accommodation. Duboisia differs from atropia by the persistence and greater rapidity of its action on the muscle of accommodation. Duboisia is indicated in all cases in which atropia acts badly. However, in two cases of iritis reported by Galezowski it has caused as much irritation as atropia. M. Gubler has used it for the sweats of phthisis in the dose of one milligram by injection. He has employed it in the same proportion to raise the number of pulsations, which had fallen to forty in the case of a tuberculous patient, and as a calmative in a case of maniacal delirium. The hypodermic injection (1 part to 200) at the rate of two drops a day at the beginning is the most

convenient mode of employment as a collyrium intended to cause mydriasis. M. Galezowski gives from 0 02 gram to 0·10 gram in 10 grams of water at the rate of three to five drops a day. In cases of inflammation of the cornea from foreign bodies the following salve may be employed with advantage, placed under the eyelid morning and evening: Neutral sulphate of duboisia, 0 02 gram, vaselin, 10 grams. (*Revue des Sciences Médicales*, Jan., 1880; *American Journal of Medical Science*, April, 1880.)

Treatment of Abdominal Typhus by the Douche.—Dr. Marcowitz of Bucharest has arrived at the following conclusion in regard to the treatment of abdominal and petechial typhus by the douche: (1) The douche allows of the regular and methodical treatment by cold applications of twelve or fifteen severe cases of typhus (two to seven or eight douches for each patient), without occupying more than two to three hours a day. 2. The patient is more effectually roused by the douche than by the cold bath; this is probably explained by the fact that, independently of the subtraction of heat, the shock acts in a reflex manner upon the heat-centres and prevents their paralysis for a period which may extend over some hours. As contra-indications, Dr. Marcowitz agrees with Liebermeister, that only intestinal hæmorrhage, or paralysis of the heart to a great extent with a small and weak pulse, are sufficient to prohibit absolutely the administration of the douche. 4. Pulmonary engorgement so long as it does not depend directly on paralysis of the heart is rather an indication than a contra-indication for this method of treatment. (*Arch. gén. de. med*, June, 1880.)

Purgatives in Phthisis.—M. Ferrand, in his clinical lectures on phthisis, recommends that the following mixture should be admistered in a cup of tea when it is necessary to relieve constipation in phthisical patients:—

Calcined magnesia, 2 to 4 grams.
Manna in tears, 30 to 40 grams.

If this laxative has to be taken often, it may be converted into an electuary by the addition of a little honey. In this form a large spoonful is to be taken every morning.

Manna in tears, 30 grams.
Calcined magnesia, 4 grams.
White honey, 30 grams.

(*Le Progrès médical*, June 5, 1880.)

Hypodermic Injection of Pilocarpin.—Dr. Ciaramelli (*Giornale Interna delle Scienze Mediche, Anno* 1, *Fasc.* x., xi.)

contributes a carefully written paper on the therapeutic and physiological action of jaborandi and its alkaloid, as observed in his own practice. He has frequently administered the drug in cases of recent and large pleuritic effusions, but could never altogether satisfy himself that any benefit had been derived from this treatment. On the other hand, he witnessed very satisfactory results from the use of jaborandi in acute rheumatism, and in anasarca depending on acute or subacute nephritis, of which latter he gives two interesting examples. He recommends the following method of prescribing the drug, viz., jaborandi leaves, 3 grams (46 grains), infuse in 150 grams of warm water, add 2 grams of acetate of ammonia, and 25 of syrup; mix,—the dose is one tablespoonful daily. As regards pilocarpin, its physiological action may be considered under two divisions, namely, the constant and the inconstant; among the former he enumerates flushing of the face, a sense of heat, salivation, perspiration, rise of temperature, increased frequency of pulse and respiration; among the latter, an increase in the quantity of urine voided (in which he differs from most observers), and an increase in the nasal and lachrymal secretions. He saw vomiting occur only in one instance, and never saw any augmentation of the bronchial or intestinal secretions. He considers the phenomena induced by pilocarpin to depend partly on acceleration of the circulation with increased tension, especially in the peripheral capillaries, and partly on a specific action exerted on the nervous centres. (*The London Medical Record*, May, 1880.)

Treatment of Dyspepsia—M. Damaschino defines dyspepsia as a morbid state characterised by slowness and difficulty of digestion This definition, so uniquely symptomatic, is very accurate, for dyspepsia is only really a symptom either during the evolution of a gastric affection or in the course of or subsequent to a general malady. The etiology of dyspepsia is very varied, for age, sex, temperament, habit, and certain diatheses exercise a marked influence upon the development and course of the digestive trouble. In this way the varied symptomatic forms which are observed in this pathological condition are explicable, as well as the inefficacy of the most rational methods of treatment which is so often noticed. Amongst the numerous remedies for dyspepsia, the digestive ferments, and of these more especially pepsin, occupy the foremost place. To enable these remedies to act with certainty they ought to approximate as closely as possible to the conditions under which they act in the natural state; by the union of pepsin with hydrochloric acid a very soluble digestive ferment is obtained, which is found to possess an exceedingly energetic action; in combination with

pancreatin, coca, and bitters, which increases its eupeptic action, it forms the basis of the elixir of Grez. This preparation acts not only by its own digestive properties, but also by stimulating the secretion of the gastric juice, so that it is also a peptogen. A great number of experiments have been conducted in the French hospitals, in regard to the use of this elixir in the treatment of intractable cases of dyspepsia, with the result that there has been a rapid improvement of the general condition, with a complete remission of all the symptoms, pains, gastric meteorism, eructations and vomiting. Affections connected with stomachal vertigo, and migraine arising from functional impairment, have been rapidly cured. Digestive troubles also, which are so frequent in adults, and more especially at puberty, as well as in chloro-anæmia, have invariably yielded to the influences of this remedy. Phthisis is nearly always complicated with dyspepsia, often in the form of obstinate vomiting, which rapidly aggravates the condition of the patient; in such cases the elixir has afforded the most excellent results by curing the vomiting and altering the state of the alimentary canal. Rheumatic and gouty patients, who for a long time previously had digested with difficulty, have recovered their digestive functions after a few days of this treatment. Lastly, this elixir has been employed at the Children's Hospital in numerous cases of chronic diarrhœa and vomiting with the very best results, and it has even been used with success in that most severe and dangerous of the affections to which children are exposed,—infantile cholera. (*Le Progrès médical*, May 15, 1880.)

Intra-Uterine Medication by Iodised Phenol.—Dr. Batty has obtained very successful results in cases of uterine cancer from the use of iodised phenol, made by dissolving one part by weight of iodine in four parts of liquefied carbolic acid. The solution thus obtained is black in colour, of syrupy consistence and possesses in a marked degree the pungent odour of iodine. Iodised phenol is applied by means of a slender and elastic hard rubber probe, made slightly tapering, and with a blunt not bulbous point. Round the end of the probe slightly moistened, a fasciculus of cotton lap is wound spirally; the *lap* being cotton wool in the form of an untwisted rope, in which the fibres of the cotton lie parallel to each other. The cotton round the probe is dipped into the iodised phenol, any surplus being allowed to drip away, and the probe is passed with a slow, spiral movement into the uterus, at first only about half an inch, afterwards, if the uterus is tolerant of the application, as far as the internal os, and subsequently into the fundus. The first probe may be followed by a second, third, and even fourth probe, the cervix and vaginal wall being wiped by similar but unmedicated probes

after each application. From this method of treatment the author claims (1) that the cervical mucus is promptly coagulated and removed, whilst there is comparative and frequently entire freedom from pain; (2) that the iodine is so rapidly absorbed by the uterus, that the patient remarks its metallic taste in the mouth and throat within five or ten minutes after the application; (3) softening and dilatation of the os and cervix; (4) temporary or permanent arrest of leucorrhœa; (5) watery and sometimes bloody discharge; (6) exfoliation of the superficial layer of the mucous membrane; (7) prompt healing of abrasions of the os; (8) disappearance of indurations of the os; (9) removal of villous growths of the endometrium; (10) disappearance of subinvolution of the uterus; (11) that the menses become regular and healthy, whilst menorrhagia and scanty menstruation, as well as dysmenorrhœa are remedied; (12) improvement of the appetite and digestion. (*The Virginia Medical Monthly*, May, 1880.)

The Inoculation of Phthisis and Rabies.—M. Chavernac of Aix read a paper before the Academy of Medicine in Paris, upon the inoculation of animals with phthisis and hydrophobia poison obtained from the human subject. The experiments with phthisis conducted upon thirty-six rabbits were entirely negative in their results, and the author believes that the success or failure of the inoculation depends upon the state of nutrition. Whilst these experiments were being carried on, a man suffering from hydrophobia due to the bite of a wolf died in the hospital, and M. Chavernac conceived the idea of inoculating one of his rabbits with the blood-stained froth from the mouth of the body. With this idea he inoculated the animal at the back of its neck, and again in its groin. No abnormal symptoms, however, were exhibited for fifteen days, but from the seventeenth to the nineteenth the animal suffered successively from loss of appetite, trembling of the skin, change of habit, restlessness, anxiety, timidity, photophobia, hurried and disorderly flight with symptoms of giddiness. When the animal escaped, it had not eaten anything for three days, and the author believes that it must have died in the course of the day. It thus appears that hydrophobia is capable of transmission from man to a rabbit. (*Le Progrès médical*, July 3, 1880.)

Baths of Lucca.—We have received from Signor Alessandro Carina, Government Director of the Thermal Establishment of the Baths of Lucca, the following note: "Will you kindly permit me to rectify some mistakes made, probably from want of personal acquaintance with the locality, by Dr. David Young, of Florence, in his account of the Baths of Lucca, contained in his valuable paper on a 'Summer in Italy,' recently published in the *Practitioner*? Dr. Young states, that until very lately, the Baths of Lucca was the only place in Italy resorted to during the summer by strangers; not on account of its springs, whose value he declares to be small, but on account of *supposed coolness*. With regard to the curative virtues of these baths, Dr. Young seems wholly unaware that their efficacy has been celebrated throughout Italy from time immemorial, (and indeed throughout Europe, since at the end of the sixteenth century it was known to Montaigne and the English dramtist Webster, neither of whom had yet left his country,) and that the number of treatises published ever since the thirteenth century to celebrate their powers would almost constitute a library in themselves.

"Now as to the supposed coolness which, according to Dr. Young, entices hither foreigners who discover too late that coolness is the only thing not to be obtained at the Baths of Lucca. Is it credible that for nearly a century, that is to say, ever since the establishment of a regular English colony in Italy, people should have flocked to a place, and for the most part returned there regularly, under the impression that it was comparatively cool, when it was in reality absolutely and excessively hot? Dr. Young proceeds to state that people are obliged by the heat to remain shut up within doors until sunset, and that then an excessive dew renders positively dangerous the change of temperature. This fact, hitherto unobserved by any one, is particularly new to me after forty-two years' residence here as Government Inspector of these baths. No one has ever remarked that the dew in this place is thicker than that which falls throughout

Italy, from the seashore to the highest Apennine summits; on the contrary, the scientific observations prove that this valley is far less subject to damp than many other spots. This is a question of facts. The thermometer and hygrometer give the exact indications; and in my various works on the Baths of Lucca, I have relied not only on my own observations, but on the published accounts of others; all of which furnish conclusions entirely at variance with those of your learned contributor.

"I cannot omit noticing, if only on account of its originality, Dr. Young's remark that those given to mountaineering can find no climbing worthy of the name at the Baths of Lucca, surrounded as they are by the highest Apennine summits on the one side, and by the high and steep spurs of the Apuan Alps, on the other.

"I do not doubt that your readers will be benefited by the correction of these erroneous statements made by Dr. Young, probably owing to incorrect information received by himself, and that you will consequently give publicity to these notes in your very valuable paper."

CITRATE OF IRON AND QUINQUININE.—We have received from Messrs. Mackey, Mackey, & Co., a specimen of citrate of iron and quinquinine. In appearance this preparation is undistinguishable from the ordinary citrate of iron and quinine, and the only difference is that it is made by the substitution of Messrs. Mackeys' quinquinine for quinine. We have already had occasion to notice the quinquinine (*Practitioner*, vol. xxi. p. 65). It is said by the makers to contain all the alkaloids of officinal cinchona bark, and to be in some respects superior to quinine. It has been tried abroad, in cases of ague, with great success, and has been found not to cause the disagreeable head symptoms frequently produced by quinine. We have ourselves tried it in irregular ague, and our experience has shown it to have the effect of preventing the attacks. On comparing it with sulphate of quinine it appears to us to be less apt to derange the digestion than the ordinary officinal preparation. We can therefore cordially recommend it. We have no doubt that the same advantages which we have observed in using the quinquinine itself will be obtained by its use in combination with iron.

MACKEYS' MISTURA CERII COMPOSITA.—This is a compound of a soluble salt of cerium, with spirit of chloroform, nux vomica, and hydrocyanic acid. The combination of these sedatives in this form seems likely to be exceedingly useful in cases of vomiting, whether it depend on pregnancy, gastric catarrh, or organic malignant disease.

Mackey's Mistura Bismuthi Composita.—This preparation contains bismuth, in combination with nux vomica, hydrocyanic acid, morphia, and chloroform. It is a very elegant preparation, and is likely to be exceedingly useful.

Papayine.—The fruit of the papaw-tree has long been used in the West Indies in order to render beef-steaks tender. An incision is made into the rind of the unripe fruit, from which a liquid juice issues, and if the beef-steak be rubbed over with this and then left for a while it becomes tender, however tough it might otherwise have been. For nearly two years back we have been engaged at intervals, along with Mr. Wyatt, in making some experiments on the digestive action of some unripe fruits, occasionally furnished to us by Professor Thistleton Dyer, of Kew. We purpose to publish the results of these experiments ere long; but some little time ago a French gentleman, being convinced that the powerful action of the papaw plant would become useful in medicine, planted a large extent of ground with the trees, and has collected the juice in much the same way as opium. A number of incisions are made into the rind of the half-ripe fruit, and the juice which exudes is allowed to dry, and is then scraped off. The product furnished by this operation occurs in coarse grains, resembling coarsely-powdered gum-arabic. It has a slightly sticky feeling when wet, and dissolves with considerable readiness in water. We have tested the digestive power of this solution, and find that it is very active. We have compared it with a specimen of pepsine of Messrs Bullock & Reynolds, which we knew to be active, and also with the liquor pancreaticus (Benger) of Messrs. Mottershead & Co., of Manchester, and find it to surpass them both in the power of digesting either cooked meat or hard-boiled white of egg. Not only does it digest more rapidly, but more easily. When either the white of egg or the cooked meat is put into a small quantity of the pepsine solution it becomes partially digested, and then the digestive action appears to cease; but when a similar experiment is made taking the same quantity of liquid in each case, and equal quantities of pepsine and papayine, the digestive action of the papaw goes on uninterruptedly until the whole of the substance has become dissolved. Unlike pepsine, it does not act in an acid solution. There is no doubt whatever that we have in this substance a digestive agent of very great potency, and one which is likely to come into very general use in medicine. We believe that the French firm who have introduced this substance into medicine will shortly appoint an agent in this country, if, indeed, they have not already done so.

Bibliography.

Hypnotische Versuche. Experimentelle Beiträge zur Kenntniss d. sogenannten thierischen Magnetismus. Von Prof. Dr. Adf. F. Weinhold. 8vo. pp. 34. Chemnitz: Bulz.

Die Entwicklung der organisirten Krankheitsgifte. Nebst e. offenen Briefe an Herrn Prof. Klebs in Prag. Von Dr. A. Wernich. 8vo. pp. 151. Berlin: G. Reimer.

Ueber die Heilwirkungen der Elektricität u. deren erfolgreiche methodische Anwendung in verschiedenen Krankheiten Von Dr. Thdr. Clemens. 8vo. pp. 752. Frankfurt: a. M. Auffarth.

Klinik der Krankheiten d. Kehlkopfs, der Nase u. d Rachens. 2. Hälfte; Krankheiten des Kehlkopfes u. der Luftröhre. Locale Therapie Instrumenten- u. Operations-Lehre. Kunstliche Stimmbildung. Von Prof. Dr. Carl Stoerk. 8vo. pp. 185-555. Stuttgart: Enke.

Beiträge zur pathologischen Anatomie. Mittheilungen aus dem k. k. pathologisch-anatom. Institut der Universitat Prag. Hrsg. von Prof. Dr. E. Klebs. 2. Hft. 8vo. pp. 134. Prag: Dominicus.

Physiological Chemistry of the Animal Body. By Arthur Gamgee, M.D., F R.S., Professor of Physiology in Owens College, Manchester. Vol. I. 8vo. pp. 488. London: Macmillan & Co.

Sick Nursing at Home. By S. F. A. Caulfield. 8vo. pp. 83. *The Bazaar* Office, 170, Strand, London.

Contributions to Orthopedic Surgery and Lectures on Club-. Foot. By Jos. C. Hutchinson, M.D. 8vo. pp. 121. New York: G. P. Putnam's Sons, 182, Fifth Avenue. London: Trubner & Co.

*** Any of the foreign works may be procured on application to Messrs. DULAU, of Soho Square, W.C.; WILLIAMS and NORGATE, of Henrietta Street, Covent Garden, W.C.; or BAILLIÈRE, of King William Street, Charing Cross.

REMARKS ON CERTAIN VIEWS REGARDING FEVERS IN INDIA.

BY SURGEON-GENERAL C. A. GORDON, M.D., C.B; Q. H. P.

THE views to which I at present desire to limit my remarks are those expressed in the *Practitioner* for July, 1880. In so far as they refer to myself, I take them in their order, but premising that the inquiry in which I with others was engaged was undertaken in obedience to official instructions, and having regard to one particular standard or definition of the disease to be investigated, namely, Enteric Fever among British troops in India.

(*a*) It is stated with regard to my paper that "attempts seemed to be made to identify a disease now by means of some anatomical character, now by means of clinical symptoms, or thirdly by an appeal to considerations of cause. The last means of identifying disease appeared questionable." The above were the precise points laid down officially for my guidance—namely "a specific form of fever characterised by ulceration of Peyer's glands, and caused by filth in air, earth or water"; they embrace what may be called the natural history of the disease to be investigated; ample details regarding each are quoted in my official reports, submitted in accordance with orders received, but those details being in absolute disaccord with the standard laid down for my guidance, I hold that I was justified in my conclusion that *the* disease as represented by that standard was not present in the cases so investigated. Nor has this conclusion been shown to have been other than correct, notwithstanding

all the generalities that by various critics have been applied to my reports. Considerations of *cause* are in India of the very greatest importance in connection with the history of disease; they involve questions of sanitation, and finance in connection therewith; and if from a *private* point of view they are looked upon as questionable, they are far otherwise with regard to Military Medicine including the hygienic management of troops.

(*b*) It is stated that "in England we were content to know enteric fever by the total of its symptoms and pathological appearances — namely, a continued fever with more or less diarrhœa, spleen enlargement, special character of temperature curves, successive crops of rose-spots and certain anatomical characters in fatal cases." In my second report I enumerate *one hundred and four* different standards, definitions, or characters held by different writers quoted to constitute typhoid or enteric fever, they differing absolutely from each other, and from the precise one in accordance with which my inquiries were undertaken. I also show in my reports that each character so laid down was not invariably present, nor was it confined to one particular form but occurred in different forms of disease. Thus taking the above diagnostics in their order, diarrhœa, absent in eleven cases out of sixty-five of specific pythogenic fever, occurs in fevers of non-specific origin, climatorial and otherwise; enlargement of the spleen, not always recorded in cases of specific fever, occurs in India as a result of malaria, and even in some cases, especially in children, in the absence of febrile attacks at all. The three standards of temperature curves from the works of recognised authorities, given in my first report, differ from each other, and between those shown on the charts having reference to individual cases recorded in my second report the differences are absolute. Rose-spots, not always present in specific fever, occur upon men in India suffering from various kinds of severe disease, and at particular seasons on some who suffer from no evident disease whatever. Post-mortem appearances in all respects similar to those considered by some authors of high reputation to characterise specific fever, are even in England held by other equally high authorities as by no means to do so, while as regards India "experience has taught that morbid anatomy is not always to be trusted as a cause of

death; very similar textural changes are produced by widely different systemic diseases." Hence, what we in England were content to know with regard to these points is insufficient, and misleading when applied to fevers in India. Not only does the spleen become enlarged as just stated under the operation of endemic, climatic, and malarial influences, but so do other gland-like and glandular tissues including the thyroid body, the liver, the intestinal and mesenteric glands. From the frequency with which in the Madras Presidency acute *albuminaria* occurs in connection with fever I am inclined to include the kidney among the tissues above-named, and I take the opportunity afforded me by these remarks to solicit the attention of medical officers in India to this phase of our general subject.

(*c*) It is remarked that "inquiring as to the way in which fever made its appearance in a household—to say nothing of inquiry in a stricter sense as to cause—had been found to involve a process of living over again, as it were, the life of each patient before his attack" With the soldiers to whom my remarks refer, little, if any, difficulty was experienced in following up the life of each patient before his attack; medical officers associated with them were able to supply sufficient information on these points; that information is given at length at pages 73 to 100, and 108 to 155 of my first official report. The conclusion to which I was thus led is given at page 103 of that statement, and I hold has not been contravened, namely, that "In no instance has it been possible to find the existence of local and specific conditions of a nature to originate or influence the occurrence of specific pythogenic typhoid or enteric fever among British soldiers or their families within the Madras command." But if local and specific conditions were inoperative such conditions as were by the older medical officers deemed sufficient to induce fevers as also other endemic diseases among these classes were present and active, even if insufficiently recognised; including climatoral, seasonal, endemic and epidemic influences; individual conditions, as youth, diathesis, inexperience, recent arrival, and so on.

(*d*) It is said that "that process was difficult enough of accomplishment under the conditions of English society, but must needs be incomparably more difficult when a fever occurred in

individuals of an alien race having traditions and caste notions separating them by wider intervals from the people who were endeavouring to investigate the origin and spread of disease among them." With reference to these remarks, I observe that they indicate on the part of their author an entire misapprehension as regards the classes to whom my inquiries had reference, namely, British troops; and that they are consequently inapplicable to my portion of that inquiry. Various are the terms by which from time to time the British soldier has been designated; but that of "an alien race" is ethnologically and altogether new.

(*e*) It is stated that "it was perfectly permissible to regard much of the described fever of India as being identical with European enteric fever." That this is so or not, depends entirely upon the *standard* taken of what constitutes the latter. I have already mentioned that according to which my investigations were constructed, and have narrated the circumstance, that according to my view not a single case of those which came under my cognisance came up to that standard. But, as already observed at pages 241 to 244 of my second special report, I enumerate one hundred and four different views having reference to what, by different writers is looked upon as *the* disease so named. At page 246 of my second report I quote as follows with regard to England, "The fact is, unfortunately for the statistician, the expression *typhoid* fever is not always used in the same sense by different medical men, but is occasionally applied to cases to express a generally low, *typhoid* condition." At page 70 of my first report, adverting to differences of opinion as to what in reality constitutes specific enteric fever, I write, "Not only with regard to causation but also to the phenomena of this form of fever so great differences exist in the writings of various authors that we in India may fairly doubt whether their descriptions refer to similar conditions." Thus it seems to me very necessary that we have more precise data to go upon than are as yet before us, before we can reconcile observations having reference to one standard out of that number with the remaining one hundred and three.

(*f*) An allusion next occurs to "this multiform disease," which bears out the correctness of my remarks just made. If, under

instructions, I or any other man, set to work to investigate a disease as represented under one particular form, and then, having found that that particular *form* does not exist, we are told that the *form* we should have looked at is something else, the question naturally presents itself, where is all this to end? As observed at page 241 of my second report, "this circumstance induces me again to indicate what indeed I have several times already said, that with a view to facilitate further investigation with regard to enteric or typhoid fever in this part of India, it is very desirable that a separate standard be authoritatively laid down, *and stuck to.*" As already remarked, my inquiries had reference to one distinctly defined *form* of disease, with the result, not controverted by any one of my critics, that none of the cases investigated by me came up to that form or standard. If the inquiries are to be continued, not with reference to the *form* first defined, but with reference to a different standard, let them be so; but at the same time let that new standard be stated in such a way that inquirers may know exactly what is the precise object of their inquiries.

(*g*) It is said that I had conducted my inquiry "obviously from the point of view that it was doubtful whether the distinction of enteric fever as a separate and specific form of fever as maintained in Europe could be maintained." As already observed, I began and conducted my inquiries under definite instructions, and with reference to a particular standard of disease, to which standard, according to my views, not a single case of those investigated by me came up. Neither have I seen in any of the critiques of my report that the critics have been able to point out a single case that did.

(*h*) The "promiscuous character" of quotations in my first report is commented upon. It seems to me that only by extensive quotations from the works of authorities can we obtain a large and liberal view of disease, as, indeed, of anything else. It is this very promiscuous character of my references that led me to the inference expressed at the end of paragraph 14 of the paper I had the honour to read before the Epidemiological Society, namely, that "with regard to the several points referred to by medical officers, very different, if, indeed, not opposing opinions are entertained among themselves; also that differences

x 2

of opinion exist with regard to causation, phenomena, and pathological conditions in connection with what is termed *enteric* fever; while in regard to not one of the points enumerated is there concurrence of opinion." According to my view an inquiry in which "quotations of a promiscuous character" are ignored or insufficiently compared with each other and considered, acquires a character by no means impartial or such as *ought* to distinguish public investigations such as that in which I was engaged.

(*i*) With reference to a remark in my paper quoted from page 70 of my first report, allusion is made to the circumstance that, whereas a very eminent English physician, writing in 1843, expressed his belief in the unity of fevers, he now acknowledges specific differences between them. That this is so, in no way affects the fact at the date alluded to. In paragraph 3 of my paper a considerable number of conflicting views are enumerated; they might be added to by further extracts from my official reports; but as they stand they indicate very clearly that several authorities *now* believe in the unity of fever; also that one of high eminence is of opinion that "continued fever frequently occurs without any organic poison; in other cases, *cerebral* or *pulmonic complications* might furnish a specific name,"—that is, in a sense similar to enteric. At page 11 of my first report I quote as follows from an author of great eminence, whose name I there give. "Ulceration of the Peyerian patches is by far the most noteworthy fact, pathologically speaking in the natural history of enteric fever, yet it will not do on a fact like this to found in the matter of diagnosis; after you have settled that there are cases of fever with ulcerated intestines, you have still to settle whether these cases are different in nature from other cases, in many respects similar, in which the intestines are not ulcerated." At page 18 of the same report I further quote from another eminent authority whose name is given, viz., "What we do find in hot climates? Intermittent fevers assume a malignant form; they become *typhoid* nearly in their commencement, that is, accompanied by an enormous amount of congestion in the internal organs, and by a palpable change in the condition of the blood in them." And so on. With all this, however, let not attention be withdrawn from the circumstance that the investigation in

India was with reference to a particular standard—and that in no case was that standard attained. With regard to fevers in India, at page 19 of the same document I thus give extracts from the older authors in that country :—"Intermittents often run into the remittent type and then become continued; remittents and continued fevers in their turn change to intermittents." "The fevers of the eastern hemisphere seldom go through their entire course without presenting morbid action in some viscus or texture, most frequently in those of the abdomen and cranium. It is not considered however that the visceral disease in certain localities ought to be viewed as the immediate cause of the febrile excitement, or in other words that fever is merely a general disorder supervening to those of a particular organ; on the contrary, the exciting causes of fever produce disorder of the frame generally, which owing to the predisposed state of certain viscera or textures occasions a permanent derangement in them."

(*j*) It has been stated that a *habit* is conspicuous in my report of writing of the continued fevers of India as a single disease. I describe not less than twelve *varieties* in 175 cases. The expressions thus referred to have reference to conditions; but even taking the exception as here recorded, and accepting the term *variety* as it stands, it no more is a synonym for *species* than such an expression would be with regard to an object in botany or zoology. That fevers of the same species in India as elsewhere vary in *type*, is indeed evident from the authorities I quote in paragraph 18, page 61, of my second special report. "It is in accordance with general experience, whether at home or in India and other tropical countries, that epidemics of fever differ from each other in different years, even in the same place. In some epidemics the symptoms are inflammatory, in others *typhoid* or adynamic: in one epidemic the brain suffers most, in another the mucous membrane of the intestines, in a third the lungs, in a fourth the liver." Taking these remarks in connection with the preceding, perhaps my critics will be so good as to indicate the precise point at which one species of Indian fevers or fever begins,—that where another ends. But I question if they can.

(*k*) My inquiry is said to have been "carried out under the

assumption that the years of labour which have been devoted to the personal investigation of the subject of enteric fever by the great teachers in Europe and America, would be sufficiently represented by a series of formal returns filled up indiscriminately." I am quite unaware that anything whatever occurs, either in my official reports, or in my paper to which the above remarks more particularly refer, to give support to them. As a matter of fact, and as already mentioned, my inquiry was begun and carried out simply under official instructions, and as a portion of my official duties. As to any assumption on my part, one way or another, the following extract from page 18 of my second official report with reference to my first series of investigations, namely, those personally made at Bangalore in the autumn of 1875, explains what my impressions then were, Adverting to my report on that occasion, I wrote thus:—"At the time that the above remarks were written I took the point for granted that specific enteric fever did really affect British troops to the extent recorded by medical officers. As a result of careful investigation at Bangalore I found that in no one respect did the circumstances connected with the recurrence of the disease so designated, chime in with those described by standard authorities as connected with pythogenic fever in Britain; that in fact the cases described differed in no evident respect from those of ordinary endemic fever in India." The remarks by my critic lead me to refer to the published reports of meetings of the British Medical Association in 1879 and 1880. According to the former, during the last forty years large sums of money have in England been expended in sanitary improvements, but the rate of mortality from 1861-70 was precisely what it had been in 1841-50, namely 22·35 per 1000; diarrhœal diseases had meantime increased, and any diminution that may have occurred in *typhoid* fever was described as small. According to the latter, "as we have learned the natural course of most acute diseases, so have we come to trust less in drugs and leave more to nature"—in other words, to let disease take its course. At page 245 of my second report I write:—"So far have been the measures applied to stations from reducing the fatality of fevers returned synonymously enteric or typhoid, that of late years the proportionate

fever mortality has increased to a very serious extent Such are the results that have attended measures based upon the pythogenic and specific theory of causation theory," "and of the remedial regime followed in accordance with that theory." Such being the *results* I hold that in the interests of our soldiers in India the following remarks on the same page are justified, namely, "Surely the time has arrived to seriously consider whether there be not a fundamental error in the theory itself, and whether, after all that has been said and written on the subject we have anything else to deal with than the endemic and climatical fever described by the older writers, and, by them *treated according to that theory.*

(*l*) The value of the returns made is next impugned. The "Sanitary" returns given at pages 73 to 100 of my first report, are so far those officially rendered throughout the service in accordance with existing regulations, the few additions made to them being with special reference to the particular points to which, under official instructions, my attention, and that of all medical officers in the command, was directed. Those which occupy pages 108 to 155 were formulated by me in conjunction with the next oldest and the most experienced medical officers with whom I was associated, and with the desire to embrace the largest possible number of particulars on all points connected with the disease under investigation. The information given in them, under signature of the medical officers on the spot, justifies the following conclusion stated at page 103 of my first report, namely, "The general results of the foregoing reports is that in no instance has it been possible to find the existence of local conditions of a nature to originate or influence the occurrence of specific pythogenic typhoid or enteric fever among British soldiers in the Madras command." Nor has a single instance in which that conclusion is other than exact been pointed out by my present, or any other critic, who has done me the honour to comment on my official reports. It is one thing to find fault, another to suggest improvement. A specific proposal in the latter direction would no doubt be extremely valuable.

(*m*) It is said that I do not hesitate "to use the whole of the 175 cases as furnishing evidence to decide the question of

relation of enteric fever in India to filth or other specific causes." What I actually did express, occurs at page 69 of my first report, namely, "Let the preceding records of individual cases, speak for themselves. They include 175 of all sorts, as already remarked, out of which number, if my views are correct, only seven approximate to the standard of typhoid fever according to British authors, while in not one instance has the disease been traced to pythogenic causes If not traceable to specific causes, then it seems to me necessarily to follow that the disease has resulted from general influences, in other words, from endemic conditions affecting masses or individuals." Nor, as already observed, has the correctness of my conclusions thus stated been contravened. It is right and well that my statements contained in public documents should be discussed and criticised; it is only by discussion that points regarding which obscurity is considered to exist can be cleared up. But in order that such points may be discussed on their own exact merits it seems to me desirable that my statements shall be quoted precisely as they were written by me.

(*n*) A remark occurs on the subject of diagnosis which I cannot help thinking arises from misapprehension with regard to the actual manner and purport of my report, and which, so far as I can even now perceive, is unsupported by anything I have therein stated. At p. 233 of my second report I enter somewhat fully into this subject. I there express myself thus: "I observe that not only do the opinions held by medical officers in regard to the form of disease so named differ among themselves, and from those of the sanitary commission, but that as specially noticed at pages 151 to 154 of that report, not only are such differences absolute in views expressed by different medical officers who had seen particular cases, but the opinions of treating medical officers regarding their exact nature of particular cases varied from time to time. I therefore take leave to observe that difference of opinion with regard to a question of abstract and inexact science affords no ground for the assertion that in the expression of such difference an error of judgment is implied." As already noticed one of my critics designates enteric or typhoid "a multiform disease;" no doubt in each case the medical officer diagnosing the disease

adopted his own particular standard out of the one hundred and four enumerated by me at pages 241 to 244 of the same document; that such diagnosis however, was in some instances at least conditional, appears by the following extract from a report quoted at page 49 of my first report, namely, "I am inclined to think that many of these were severe forms of *remittent fever* and not enteric fever, *although* the post-mortem examinations revealed ulceration and infiltration of Peyer's glands"—"head affections being early and prominent symptoms, more resembling a man suffering from sunstroke." But according to the quotation from the report by another medical officer, and one of great Indian experience, given at page 95 of my second report, "if Dr. Gordon determines with the definition laid down"—as in accordance with instructions I did—"that no fever is enteric except such as is caused by excremental poisoning, then I consider *he was justified in rejecting the cases he did.*" Let my critic show the contrary —if he can.

(*o*) It is stated that in a considerable number of cases the patients were *exposed* to fœcal emanations, and to *liability* to infection. At Cannanore the men who respectively occupied barracks nearest to and farthest from fœcal effluvia suffered equally severely from fever; those who occupied the intervening barracks suffered least. The two first sets of barracks were situated *end on* to the prevailing wind; the latter *side on*, and thus open to through and through perflation. At Fort St. George, where fœcal and other emanations were often most offensive, *enteric* fever was unrecorded. See on these points pages 52 to 60, and 140 to 147 of my first report; and 14, 25, and 51, of my second. As to *liability* to infection, I remark that, according to reports under the signature of individual medical officers, *as an absolute fact,* not a single case was traced to this source.

(*p*) Objection has been taken to the manner in which, in my first report, the words "causation," "filth," "malaria" and "climate" were made use of. In every instance they were so employed in accordance with authority and in a sense perfectly understood and accepted by the authorities for whose information and by whose instructions my report was submitted. I briefly remark

on each of them: The term *causation* refers to the entire conditions, so far as they could be ascertained, under which particular *causes* were considered to act, including also a consideration of those causes themselves,—that is, the whole etiology of the disease under consideration. In this sense, the expression being an ordinary one in official warrants, I find it also made use of at page 77 of the *Practitioner* of last July, in the remarks to which the present are intended to be something in the shape of a rejoinder. The expression *filth fever*, used by me, was exactly as it occurred in the official instructions under which my inquiries were carried out. This I quote more fully at page 234 of my second report. It is made use of by the authority whose words I quote in paragraph 4 of my paper so often alluded to, namely, with reference to England, "as regards enteric fever, and probably other contagious diseases, to wit, diphtheria, we do not think that the *filth and drain* theory will stand,"—and in reference to which I say in that place: "Please to observe this is not my language; it is that of an eminent English physician, and leading authority in regard to our present subject." But is not exactly the same thing expressed by the objector to this term in the remarks quoted from him in the preceding paragraph, namely, "that in a considerable number of cases the patients were exposed to *fœcal* emanations"? If any actual difference between the two expressions can be said to exist, it is simply one of *condition*. As to *malaria* and *climate*, it appears to me that the remarks I am now considering refer to my first report rather than to my paper read before the Epidemiological Society. In the latter, under paragraph 11, I thus expressed myself: "The circumstance is well known in India, and other tropical and semitropical countries, that the term *malaria*, besides signifying marsh miasma is *applied to other undefined influences* existing in localities and on geological formations incapable of yielding miasm of that nature; also that in such localities, and on such geological formations, forms of disease in all respects similar to those which occur where miasms prevail, also present themselves; among them hepatitis, dysentery, remittent and intermittent fever, and so on. Hence, *in India*, the expression *malaria* can only be accepted as a synonym of climatic

influences. At page 18 of my first report the following remark occurs: "As to the expression 'malaria' itself, it may be well to explain that, as made use of in this report, it applies to endemic influences rather than to a specific entity; that those endemic influences are thus described by Cabanis: "L'ensemble de toutes les circonstances naturelles et physiques au milieu des quelles nous vivons dans chaque lieu." As quoted in paragraph 11 of my paper, "the effect of influences of this nature was thus acknowledged by the Royal Commission on the State of the Army in India, 1863, namely,—By far the larger proportion of instability and inefficiency of that army has arisen from *endemic* diseases, and notably from fevers, diarrhœa, dysentery, and diseases of the liver; the predisposition to these diseases is in part attributable to *malaria,* in conjunction with extremes of temperature, position, and variability;—that is, to local and climatorial conditions." According to the Army Sanitary Commission, as quoted in paragraph 22, page 245, of my second report, it appears then that "in the present state of facts we are not warranted in extending to India the same etiological definition and relationship of enteric fever as it is known to possess in England, and that we must admit *climatic causes,* amongst others temperature and malaria, *neither of which* are operative at home, as among the predisposing causes of this fatal disease in India." These quotations might be added to; but as they stand they are, I trust, sufficient to illustrate the sense in which the expressions *malaria* and *climate* are made use of in my report and paper under comment, and generally understood. If my critic will be so good as to define *malaria* and *malarial* diseases as distinct from climatic and endemic influences and diseases he will confer an important benefit upon future investigators. But at the time my inquiries were made such distinction had not, to my knowledge, been defined.

(*q*) It seems to me that the entire gist of the present question at issue is thus indicated at page 244 of my second special report namely: "According to views expressed in the works of (the older) Indian medical officers, soldiers, and particularly those who were young and full-blooded, suffered from a fever, *sthenic* in its early stages, but in its later complicated with visceral

derangement, intestinal, that is, *enteric* among others, accompanied by a low, typhoid, or adynamic state; in those of weakly frame, asthenic from the first. The fever was formerly looked upon as the result of endemic and climatorial conditions, acting upon individual constitutions and habits, and treatment was applied in accordance with those theories of its causation and nature. On the other hand, a name has been of late years applied in a specific sense in accordance with one particular complication out of many, that name theoretically held to imply the presence of a particular type of disease *asthenic* in nature, the result of a particular set of causes connected with filth; while in accordance with both those theories remedial measures have also been employed. According to the literature of this question the former set of opinions with regard to India have, for some time back, been more and more discouraged, the latter yet more and more encouraged." According to my view, the Army Sanitary Commission has exactly hit upon this very point in its remarks, quoted at page 238, namely: "Has not the whole divergence of opinion arisen from transferring to Indian stations the local etiology of *typhoid*, as it presents itself commonly in London, for example?" On this question the president of the Epidemiological Society, in his introductory lecture, thus expressed himself: "I am, and long have been, of opinion that a form of fever exactly like European typhoid, except in its etiology, exists in India and other hot and malarious countries, and that it is due to *climatic causes*, not to filth or specific causes, such as give rise to it in England and elsewhere.' Even as regards this *filth* theory, there are authorities, and very high authorities, quoted by me in section *a*, paragraph 4, of my paper, read before the Epidemiological Society, who by no means accept it; and yet, as I remark in that paragraph, "with regard to a form of fever, the definitions of which vary among themselves, and the causation of which is still undecided, so long as we depart from generalities and individual conditions, inquirers in India whose inquiries have failed to demonstrate certain specific causes of what has been indicated to them as a specific disease have had very severe expressions applied to them. Meantime, however, their views are leavening opinion at home." Let us now test the theories above alluded to by their *results*. This

appears to me perfectly fair, and in accordance with custom, when any two or more systems or methods are to be compared. According to a high official authority quoted at page 43 of my second report, "the diagnosis between *enteric* and *continued* fevers (in India) is more a question of the gravity of the individual case than of difference of symptoms. Practically, in the army returns all bad cases are now classified as enteric fever," while the milder forms of the same disease are classified as continued fever. Nor is this all. Continuing the quotation, as above, from p. 244 of my second report, this official statement occurs: "It hence appears that of late years the proportionate fever mortality *has increased nearly a fourth,* and that the proportion of fatal cases entered as *enteric* to all other fevers has quadrupled." Surely, then, the necessity is made apparent that the entire subject of fever in India should be reconsidered, and, I should say, more from an Indian point of view, less from an English, than during the last twenty years or so, it has been. At page 73 of my first report I expressed a hope that an inquiry of this nature should be instituted; at page 202 of my second I repeat that expression; and with a view to encourage full inquiry I, about a year ago, handed over to the Government of Madras the sum of 500 rs., equivalent at par to £50, to be awarded as a prize to be given to the writer of the best essay on fevers as affecting British troops in India. The conditions of the award are given at page 331 of the Army Medical Blue Book for 1878.

DRAINAGE OF WORKHOUSES.

THE following instructive circular has been issued by the Local Government Board relative to the drainage of workhouses and other poor-law institutions.—

"Sir,—I am directed by the Local Government Board to state that they have had under their consideration the reports made from time to time by their inspectors regarding the system of drainage in operation at various workhouses and other poor law

institutions, and it is evident to them that in many instances the arrangements in this respect are not as satisfactory as could be desired.

"The Board find that while in many cases the drainage is conveyed direct into the public sewers, there are numerous examples in which it is collected in cesspools, and moreover that the contents of these cesspools are frequently allowed to escape either by soakage into the ground or by overflowing and discharging into a ditch or a pond or a stream.

"In reference to arrangements of this character the Board deem it right to point out that, if existing in an urban sanitary district, they would be in contravention of the 47th section of the Public Health Act, 1875, which enacts that—'Any person who in any urban district . . . . (3) Allows the contents of any watercloset, privy, or cesspool to overflow or soak therefrom, shall for every such offence be liable to a penalty not exceeding 40*s.*, and to a further penalty not exceeding 5*s.* for every day during which the offence is committed.'

"Although this enactment relates only to such cesspools as are within an *urban* sanitary district, it would nevertheless be very desirable, for sanitary reasons, that, even when the workhouse is situated in a *rural* sanitary district, every effort should be made so to deal with the sewage that it shall not pollute the soil in a manner that would be illegal in an urban sanitary district. Moreover the flowing of sewage into streams and watercourses is prohibited in rural as well as in urban districts by the Rivers Pollution Prevention Act, 1876.

"In view of the considerations above referred to the Board think it may be of use to point out a few general principles to be observed in regard to the disposal of sewage from workhouse buildings.

"They would first observe that cesspools should never be allowed to exist if sewers are within an accessible distance.

"The 21st section of the Public Health Act, 1875, authorises the owner or occupier of any premises to drain such premises into the sewers of the district, and the 23rd section gives power to the sanitary authority of any district to require the owner or occupier of any premises which are without a drain sufficient for effectual drainage to make a suitable drain, and connect

it with the public sewer, provided such sewer be not more than 100 feet distant from the site of the premises.

"If cesspools are rendered necessary by the absence of other proper outfall for drains, it is most important that they should be made absolutely water-tight, and be so situated as to be out of the line of the natural drainage of the locality, and as not to endanger the wells or other sources of water supply. They should also be so far distant from buildings as to be incapable of becoming a nuisance to the inmates. Moreover, they should be so placed as to allow of their contents being periodically removed and applied, where practicable, to land under cultivation.

"If there are no sewers available and the circumstances of the locality will permit, it may be possible to dispense with cesspools altogether and to deal with solid excrement on some dry system, and apply the slop drainage direct to land by way of irrigation. Care, however, must be taken that the land to be irrigated is of adequate size, and possesses the requisite fall, and is itself capable of being drained; and whenever the dry-earth, pail, or ash system for excrement removal is used, it is indispensable that a regular system of superintendence and removal should be organised and rigidly carried out.

"Where drains are connected either with public sewers or with cesspools, it is essential that means should be taken for preventing sewer-air or cesspool-air from ascending into the drains of the building. This may be effected by a water-trap in the drain at a point near to the sewer or cesspool, with an opening for ventilation on the side of the trap nearest to the workhouse buildings. Such opening may often be in the form of a man-hole giving access to the drain.

"With regard to the ordinary drains themselves, which should be formed of impervious pipes, they should in no case whatever pass under or be within any building.

"If surface water has to be conveyed away from the floor of any building, such as a washhouse, for example, it should pass by means of surface channels to gully gratings outside. In the same way every pipe for carrying off waste water, whether from a bath, lavatory, or sink, or the overflow pipe from a cistern, should be taken through an external wall and discharge

visibly in the open air over a channel leading to a gully grating outside communicating with the drains.

"The drains should be laid in direct line and uniform gradient between the points where they change direction or gradient, and at these points it is convenient to provide means of access to the drains for the purpose of inspection or cleansing.

"Ample means of ventilating the drains of the building by suitable openings at their lower and upper extremities, and of flushing them, should be provided.

"The soil pipe from any watercloset should always be outside the building, and be continued up beyond the point of junction with the highest closet, and without diminution of diameter, to some point where it will afford a safe outlet for drain-air.

"Where privies of any kind are in use, much care and attention is needed to prevent them from becoming a nuisance. They should be so arranged as to avoid any considerable accumulation of filth during a lengthened period. Hence the size of the receptacle or pit beneath the seat should be strictly limited, and the filth should be removed therefrom at regular and frequent intervals. Ordinarily, a very moderate capacity should suffice for the receptacle, when fixed, of each privy, whilst if the receptacle be movable, such as a tub or pail, a capacity of more than two cubic feet would be inconvenient. Where fixed receptacles are in use, they ought under no circumstances to be sunk in the ground, but should rather be raised at least three inches above the level of the adjacent ground, and the floor and sides should be made of stone-flagging or other non-absorbent material. The privy receptacle should be so arranged that under no circumstances whatever would rain-water be allowed to enter it, and of course no slop-water should be emptied into it.

"The Board request that the foregoing remarks may receive the attention of the Guardians in so far as they are applicable to the buildings over which they have control.

"I am, sir,

"Your obedient servant,

"JOHN LAMBERT,

"Secretary."

THE PRACTITIONER.

NOVEMBER, 1880.

Original Communications.

MALARIAL FEVER.

BY CORRADO TOMMASI-CRUDELI,

Professor in the Royal University of Rome.

THE readers of the *Practitioner* will, I feel sure, be interested to hear of the results of the most recent investigations, made in Italy, during the present year, on the subject of malaria. The interest which this journal has taken in this subject since the publication, last year, of the studies and experiments made by Professor Klebs and myself, leads me to think that its readers may be glad to be informed of facts recently ascertained before they are communicated in all their details to the "Reale Academia dei Lincei," in its first session in December next.

After the investigations which I made last winter on some of the malarious districts of Sicily (Atti dei Lincei, March 6, 1880), in which I constantly found the *Bacillus Malariæ* with all the characteristics described and represented by Professor Klebs and myself in our work "Sulla Natura della Malaria"—which *Bacillus* I was unable to find in non-malarious districts situated in the neighbourhood—other investigations have been made, at different times and in various places, by the following gentlemen:—Professor Perroncito, of the Superior Veterinary

School of Turin, Professor Ceci, of the University of Camerino, Dr. Cuboni, Assistant Professor of Botany in the University of Rome, and Professor Marchiafava, Demonstrator of Pathological Anatomy in the University of Rome, under whose direction the following gentlemen have worked during the last summer in my laboratory—Drs. Valenti, Ferraresi, Sciamanna, and Piccirilli, of Rome.

The following is an abstract of the results of the investigations made by these gentlemen

1. In the soil of all the malarious districts of the Roman Campagna and Marshes the *Bacillus Malariæ* has been either found in a fully developed state (Cuboni), or else could be easily obtained in great quantities by means of artificial cultivation (Cuboni, Ceci). It has not, on the other hand, been found possible to obtain it by any means, whether artificial or otherwise, in some perfectly healthy districts (Cuboni).

2. This *Bacillus* rises in such quantity during the heat of summer in the atmosphere of malarious districts, that there is no need of any special appliances to collect it from the air. It is to be found in large quantities in the sweat of the face and hands (Cuboni).

3. In the blood of rabbits infected with malaria (Ceci), in the blood of human beings attacked by malarious fever (Marchiafava, Ferraresi, Sciamanna, Valenti and Piccirilli); and in the blood extracted from the spleens of the patients in question by a method invented by Dr. Sciamanna (Marchiafava, Ferraresi, Sciamanna, Valenti and Piccirilli), the spores of the *Bacillus Malariæ* were constantly found during the *acme* of the fever. The artificial cultivation of this blood has constantly given rise to the development of the *Bacillus*, sometimes in very large quantities (Ceci, Cuboni, Ferraresi). The cultivation of the splenic blood of persons not affected by malarious fever has given, on the contrary, only negative results (Cuboni).

4. By injecting the blood taken from the veins of persons affected with malaria into the subcutaneous tissues of dogs, the disease is reproduced in these animals (Marchiafava, Ferraresi, Valenti, Sciamanna and Piccirilli).

5. In all cases where the blood has been extracted from patients affected with malaria, during the *period of invasion of*

the fever, it contained, often in great quantities, the fully developed *Bacillus Malariæ* (Marchiafava, Ferraresi). In the *acme* of the fever, on the contrary (as has been mentioned above, § 3), the *Bacilli* disappear, and no other traces of them are found beyond their spores.

The constant recurrence of this last phenomenon (analogous to those observed in the case of the *spirillum* of relapsing fever) is of the greatest importance in the question under consideration. It explains, in the first place, the difference in the results obtained by Marchiafava in 1879 by examining the blood of five persons who had died of *febris perniciosa*, the examination being made immediately after death. In three of these cases the blood of all the veins of the body and of the heart contained a large quantity of *Bacilli* in an advanced stage of development, while in the other two it was impossible to discover in the blood a single example of the *Bacillus*, but only a large number of its spores. The further investigations made this year in Rome render it probable that the first three patients died before the period of *invasion* of the fever was finished; the other two, on the contrary, during the *acme*. These facts, further, open to us the way, by multiplying and varying our observations, to determine the scientific theory of this infective disease.

Experiments made on animals have shown that the principal *nidus* of the parasite which produces malarial fever is in the spleen and in the marrow of the bones, the organs in which (especially in the first) we constantly find the most serious pathological changes in those who die of this fever. It is very probable that the production of new generations of parasites in these seats, varies in extent and in rapidity according to the condition of the individual, and probably also according to the quality of the soil from which the parasite originally came;[1] which would also explain the great variations which we meet with in the duration of the intermittences of this fever. It is probable that the febrile attack does not take place until the discharge of the parasites, from their special *nidi*, has gone on to such an extent as to accumulate in the blood a vast number

[1] Comp. the work of Pasteur on the parasite, discovered by Perroncito, which produces cholera among fowls.

of these organisms. It is probable that the chills of the febrile attack are produced by the simultaneous irritation of all the vaso-motor nerves, due to the presence of this army of invaders in the circulatory system. These invaders find in the blood the conditions most adapted to accelerate their development and their progress to maturity (*i e.* a high temperature, abundant means of nourishment, and oxygen stored up in the red corpuscles), and hence it is not surprising if their disintegration is completed in the *acme* of the fever; while, on the other hand, the changes in the component elements of the blood and tissues due to their multiplied acts of assimilation and excretion affords a natural explanation of the development of the febrile heat.

The further investigations which I propose to make, personally or by means of others, will demonstrate if this scientific theory of malarial fever, suggested by the facts recently observed in my laboratory, be sound or not. I hope further that future observations will enable us to decide whether the *resolution* of the febrile attack is due merely to the elimination, by means of the secretions, of the products of the reduction of the albuminoids accumulated in the blood and in the tissues during the febrile attack; or whether it is partly also due to the elimination of the spores, which the disintegration of the *Bacilli* leave in the circulation, by means of the secretions, especially that of the kidneys. It will further be of great scientific, and possibly also practical, interest to examine the contents of the venous cavities of the spleen during the period of intermittence of the fever; and since the method has been discovered of extracting the blood from the spleen without danger to the patient, it is possible that we may be able to follow step by step, in this its principal *nidus*, the development of the parasite in the intervals of the febrile attacks

INDIGESTION AS A CAUSE OF NERVOUS DEPRESSION.

BY T. LAUDER BRUNTON, M.D., F.R.S.

(*Continued from page* 272.)

BUT bile is not the only substance which produces a depressing effect upon the circulation when absorbed into it from the portal system. I have already mentioned that certain albuminous products of intestinal digestion and peptones occasionally make their appearance in the urine. Amongst the former is an albuminous substance, not precipitated by boiling, but by nitric acid in the cold. This substance I have observed in the urine of a healthy man after he had drunk a large quantity of strong beef-tea at a draught upon an empty stomach. My attention was drawn to the urine by the froth remaining upon it for a somewhat unusual time. On examination, this substance was discovered in it. On examining the beef-tea which the person had taken a similar albuminous substance was found in it, so that there can be little doubt that in this case the albumen was simply absorbed so rapidly from the stomach or intestines that it passed without change through the portal system into the general circulation, and thus reached the kidneys, where it was excreted in much the same way as sugar would have been under similar circumstances. We find only too frequently that both doctors and patients think that the strength is sure to be kept up if a sufficient quantity of beef-tea can only be got down; but this observation, I think, raises the question whether beef-tea may not very frequently be actually injurious, and whether the products of muscular waste which constitute the chief portion

of beef-tea or beef-essence may not under certain circumstances be actually poisonous. For although there can be no doubt that beef-tea is in many cases a most useful stimulant, one which we find it very hard indeed to do without, and which could hardly be replaced by any other, yet sometimes the administration of beef-tea, like that of alcoholic stimulants, may be overdone, and the patient weakened instead of strengthened. In many cases of nervous depression we find a feeling of weakness and prostration coming on during digestion, and becoming so very marked about the second hour after a meal has been taken, and at the very time when absorption is going on, that we can hardly do otherwise than ascribe it to actual poisoning by digestive products absorbed into the circulation. From the observation of a number of cases I came to the conclusion that the languor and faintness of which many patients complained, and which occurred about eleven and four o'clock, was due to actual poisoning by the products of digestion of breakfast and lunch; but at the time when I arrived at this conclusion I had no experimental data to show that the products of digestion were actually poisonous in themselves, and only within the last few months have I seen the conclusions to which I had arrived by clinical observation confirmed by experiments made in the laboratory. Such experiments have been made by Professor Albertoni, of Genoa, and by Dr. Schmidt-Mühlheim, in Professor Ludwig's laboratory at Leipsic.

Professor Albertoni has found that peptones have a most remarkable action upon the blood, completely destroying its coagulability in dogs, while they have little power in this respect over the blood of rabbits or sheep. The number of species upon which he experimented is limited, so that he cannot as yet draw the conclusion with certainty that peptones prevent the coagulation of the blood in carnivora and not in herbivora, although, so far as experiments go, this conclusion seems probable. He and Dr. Schmidt-Muhlheim independently made the discovery that peptones prevented the coagulation of the blood in dogs, and the latter, under Ludwig's direction, has also investigated their action upon the circulation. He finds that, when injected into a vein, they greatly depress the circulation, so that the blood-pressure falls very considerably; and

when the quantity injected is large, they produce a soporose condition, complete arrest of the secretion by the kidneys, convulsions, and death From these experiments it is evident that the normal products of digestion are poisons of no inconsiderable power, and that if they reach the general circulation in large quantities they may produce very alarming, if not dangerous, symptoms.

Such experiments as this open up a new and very wide field of inquiry, which is likely to prove of very great practical importance. We have hitherto been accustomed to reckon all peptones as identical, by whatever digestive ferment they were formed, and to look upon it as a matter of slight moment whether albuminous foods introduced into the digestive canal were dissolved by the stomach or by the pancreas, although it is quite possible that the peptones differ as much from each other as different kinds of sugars. It is a matter of wonder, also, that at the present moment, although the digestive processes have been so carefully investigated, we know very little of the uses of the *succus entericus*. Notwithstanding the great extent and evident importance of the intestine, and the large quantity of fluid which it is able to secrete: all that we find regarding the action of this secretion in such a book as Foster's *Physiology* is that "the statements with reference to its action are conflicting. Probably it has no direct action on either fats or proteids, but is amylolitic in some animals, though not in all. *Succus entericus* has also been said to change cane- into grape-sugar, and by a fermentative action to convert cane-sugar into lactic acid, and this again into butyric acid, with an evolution of carbonic acid and free hydrogen. The reason why experiments on the action of intestinal juice have given such an apparently unsatisfactory result is that they have been chiefly tried on such kinds of food as we are accustomed to put into our mouths. Now the intestinal juice is not intended to act upon such substances: its place is to finish the digestion begun by the other juices; and when experiments with intestinal juice are tried upon foods which have previously been subjected to the action of the other digestive fluids, positive, and not negative, results are obtained. Thus, for example, it was stated by Kuhne, in his lectures at Amsterdam

in 1868–9, that though intestinal juice would dissolve raw albumen and fibrine, it would not act at all upon them if boiled; but if the boiled albumen or fibrine were first subjected to the action of pancreatic juice for a short time, the intestinal juice would afterwards dissolve them much more quickly than it would even in a raw condition. The action of digestive ferments is just beginning to find a practical application in medicine, and sometimes, undoubtedly, they are of very great service; but unless their action is investigated more thoroughly than it has been up to the present, it is just possible that we may by and by find that the digestive ferments, like all other powerful agents, may do much harm as well as much good. Hitherto we have been accustomed to regard the phases of digestion, gastric digestion, pancreatic digestion, and intestinal digestion, as almost separate processes, any of which we might increase indefinitely without doing any harm to the patient. We forget the relation which each bears to the other; and yet such a relation undoubtedly exists, for we find that when pepsine is mixed with bile it is precipitated and rendered inert. Further transformation of foods by the gastric juice is thus arrested as soon as the chyme leaves the stomach. And well it is that this should be so, for if the pepsine were not rendered inert it would destroy that pancreatic ferment (trypsin) which acts on albuminous substances, and thus interfere with digestion by it. How far this prolonged peptic digestion and impaired pancreatic digestion of albuminous substances has to do with the production of poisonous digestive products in cases where the quantity of bile poured into the intestine is deficient it is at present impossible to say, but it is a condition which ought to be kept in mind in all cases where there is deficiency of bile in the intestine, and the advisability of nourishing the patient by farinaceous food is constantly considered in these cases.

And now comes the question, How is it that in healthy conditions of the intestine peptones do not pass into the general circulation, and are therefore unable to exert any poisonous action upon the nerve-centres? This question is one which we cannot at present answer quite satisfactorily.

Usually the peptones disappear from the portal blood before

it reaches the general circulation. Indeed, Ludwig and Schmidt-Mühlheim found that even in the portal blood, before it reaches the liver, very little if any peptone is to be found. They have not succeeded in discovering where the peptone undergoes change. Plósz and Gergyai, and also Drosdorff, have discovered peptone in the blood of the portal vein, and Plósz and Gergyai have been led, by their experiments, to regard the liver as the seat of the transformation of peptones. In consideration of the more recent experiments of Ludwig and Schmidt-Mühlheim, we cannot entirely adopt the view of these authors, though it is nevertheless possible that they are to a certain extent right, and that the liver, to some extent at least, serves the purpose of preventing any peptones from getting into the general circulation, which may have escaped transformation in the portal blood before reaching it.[1]

And now, having run over in this cursory manner some points connected with digestion and with the functions of the liver, we come back to the question of why it is that the mental worker becomes depressed, irritable, melancholy, and, it may be, stupid and forgetful, after a few months' work, although every part of his body may be organically healthy, and a month's holiday may be sufficient to restore every organ to perfect functional activity? One reason, no doubt, may be that his systematic overwork may produce a diminution in the energy-yielding substance of his nerve-centres, just as we see that a certain amount of atrophy occasionally occurs in overworked muscles. But this does not seem very probable. It seems much more likely that they cease to act in the normal way because during each day's activity a certain amount of waste product is formed which is not perfectly removed during the hours of rest.

All throughout the body we have most elaborate arrangements for removing waste products. In the muscles, for example, we find that the fascia which surrounds them forms a regular pumping arrangement, the two layers of which it consists being separated from each other at each muscular relaxation, and

[1] Schmidt-Muhlheim, *Archiv. für Anatomie und Physiologie; Physiologische J. Abt*, 1 & 2 *Heft.* 1880, p. 33. Albertoni, *Centralblatt, f. d. Medicinischen Wissenschaften*, 1880, p. 577.

pressed together at each contraction.[1] The lymph and the waste products which it contains are thereby actually pumped out of the muscle at each contraction, and sent onwards into the larger lymph-channels, so that the muscular action itself removes the waste products. At the same time we find that the movement of the muscles of the leg, for example, will also pump out the blood from the veins, sending it upwards from the feet, and pressing it upwards to the body.[2]

Again, we find that in the abdomen and thorax we have pumping arrangements, whereby any excess of the serous fluid which bathes the intestines and lungs is pumped out of the peritoneal pleural cavities by the action of respiration. The two layers of the central tendon of the diaphragm and of the pleura here form pumping arrangements similar to the fascia in the leg.

The brain and spinal cord, being inclosed in rigid cases, have no pumping arrangements in immediate connection with them, but the circulation of the cerebral spinal fluid in them is probably affected also by the movements of the thorax and abdomen. The cavity of the arachnoid and of the cerebral ventricles is not only continuous with similar cavities in the spinal cord, but also with the lymph-space surrounding the choroid, with the interior chamber of the eye, and even with the lumbar lymphatics; and Professor Schwalbe has succeeded in injecting these parts by a single insertion of the nozzle of his injecting syringe into the arachnoid. His observations have been confirmed and extended by Althann[3] The experiments of Quincke have shown that during life a current exists in the cerebral spinal fluid both from above downwards and from below upwards.[4] The cause of this current is, in all probability, the respiratory movements. We have, indeed, in the brain and spinal cord, a condition not unlike that which exists in the fascia covering muscles, where the muscular substance during

[1] Ludwig and Genersich, p. 53, *Ludwig's Arbeiten*, 1870.

[2] Braune, *Ber der Sachs Gesell. d. Wiss.*, 1870, p. 261.

[3] Althann, *vide Virchow's Jahresbericht*, 1872, p 156

[4] Several authors, as Abel Key and Retzius (*Nordisk medicinsk Arkiv.*, 1870, II. 1, 13—18; *Centralblatt fur Medicinischen Wissenschaften*, 1871, p. 514); Quincke (*Reichert's und Du Bois Reymond's Archiv*, 1872, 153—177; *Centralblatt fur Med. Wissen*, 1872, p. 898)

its contraction presses flexibly the inner against the unyielding outer layer of the fascia, and thus produces, in the space between them, a pumping action. The skull and vertebral canal would correspond to the hard outer layer or fascia; and the brain and cord, which, as we know, expand and retract during the movements of respiration, when a part of their bony case is removed, will have a similar pumping action upon the cerebral spinal fluid to that of the muscle upon the lymph in the fascia.

In the case of the brain and the cord there will be, in addition, a pumping action produced by the very circulation of the blood in them, the alternate expansion and dilatation, corresponding to the heart's beats, having a similar effect to that produced by the respiratory movements. As stimulation of the brain causes dilatation of its vessels, and increases the flow of blood through them, mental action of itself not only attracts more blood to the brain, but provides to some extent for the removal of waste products. The movements induced by the cardiac pulsations are not so extensive as those caused by the respiratory movements or by muscular exertion, and therefore, when the brain is over-worked, and the respiration and muscular movements are under-worked, the cerebral nutrition will be diminished by the imperfect removal of waste from its substance. But if, in addition to this, the cerebral cells and fibres are actually poisoned by the circulation within the vessels which supply them, of noxious substances due to imperfect digestion or assimilation, matters will become very much worse.

We have already seen how much the liver has to do with such a condition. Now, while the brain is being taxed to its utmost, the worker generally gets but very little exercise. The consequence of this is, that although the respiratory movements still go on with regularity, and the pressure of the diaphragm upon the liver at each respiration presses the bile more or less out of the liver, yet the pressure thus exerted is very much less than would be the case if the individual were making occasional vigorous efforts during which the breath was held, and the muscles of the abdomen put into action, as, for instance, in springing from boulder to boulder on the moraine of a Swiss glacier. So long as the brain-worker is exceedingly careful what he eats, so that no excess of bile is formed, and is

fortunate enough to escape duodenal catarrh, so that no impediment, however slight, prevents the flow of bile into the intestine, he may get along perfectly well; but if he be unfortunate enough to get what is commonly known as cold in the stomach, or unwary enough to irritate the mucous membrane of his stomach or duodenum by wines or spirits, the case is at once altered, for now the swollen mucous membrane of the duodenum tends to close the orifice of the bile-duct, or the congestion may even extend up the duct itself. Thus an impediment, however slight it may be, is opposed to the exit of bile from the liver. The pressure under which the bile is secreted, as I have already said, is very small, and there being no extra pressure put upon the liver by the diaphragm and abdominal muscles, instead of the bile being at once forced out of the bile-capillaries it will remain in them, causing more or less congestion, and now follows a whole series of disagreeable results. The bile, which may be looked upon as a waste product of the liver, not being removed, the other functions of the liver are disturbed. Assimilation becomes imperfect, we find lithates appearing in the urine; the circulation in the liver itself may be altered, and thereby the whole circulation in the stomach and intestines may be impeded, for it must be remembered that all the blood from the stomach and intestines has to pass through the liver before it again reaches the general circulation. Thus the individual becomes troubled with hæmorrhoids, secretion and vermicular movement in the bowels are impaired, so that constipation results; congestion of the stomach, with loss of appetite, impaired digestion, and flatulent eructations ensue, and the brain and nervous system begin to suffer from the accumulation in them of their own waste or the absorption of abnormal products of assimilation.

Feeling weak, dull, and melancholy, the sufferer now thinks he ought to take meat three times a day, and perhaps, during the intervals of his meals, to take strong beef-tea, or perhaps a glass of wine or a nip of brandy. Yet, in spite of all this, he becomes weaker, more stupid, and more melancholy; and no wonder. He is simply further over-taxing his already overworked digestive organs. He is piling up fuel, instead of removing ash, and choking the vital processes both in his

digestive and nervous systems. What he wants is not more nutriment, but a more rapid removal of waste, and the change upon the adoption of a proper system of treatment is in many cases most marked and satisfactory, both to the physician and the patient.

The first thing to be done is to clear out the liver. This may seem to be an unscientific expression, one adapted rather to popular notions than in accordance with ascertained facts. But this is not the case. In a former paper on the action of purgative medicines,[1] I have explained the way in which certain purgatives may be said to have the effect of clearing out the liver, and first amongst those we must reckon mercurials. In the case which we have just been describing, five grains of blue pill may be taken every night, or two or three grains of calomel either alone or combined with extract of hyoscyamus or conium, and this should be followed next morning by a saline draught. As a saline we may use sulphate of magnesia, or Friedrichshall, Pullna, Hunyadi Janos, or Carlsbad water; but whichever saline we may choose, the use of one or other of them should on no account be omitted. One of the best salines is half a drachm of crystallised Carlsbad salts dissolved in a tumbler of hot water and drunk immediately after rising in the morning, and this may be used not merely in the morning, after the mercurial, but it may also be employed every morning in cases where the bowels are constipated. The quantity of water is of considerable importance. Half a teaspoonful dissolved in a full tumbler is more efficacious than double the quantity of salt in half the quantity of water. Nor is this to be wondered at, for not only has the larger quantity of liquid greater power to wash out the intestine, but the increased amount of the water tends to increase the quantity of bile secreted, and this increase in bile is especially marked when the water is taken frequently in small quantities, as it is by persons undergoing the cure at Carlsbad, or who take the solution of Carlsbad salts at home by sipping it at intervals while dressing, instead of drinking it all off at once.

Zawilski found that when liquids were taken in this way not only was the bile secreted in greater quantity, but under a greater

[1] *Practitioner*, vol. xii., pp. 342, 403.

pressure, so much so that secretion still occurred when such an obstruction was opposed to its exit as would usually have caused the bile which had already been excreted to be reabsorbed.[1]

When the Carlsbad salts are employed after the mercurial, it is, I think, best to take them in single large draughts immediately on rising, but when used by themselves the solution should be sipped at intervals during dressing. When used alone the Carlsbad water, warmed by standing the tumbler in a basin of hot water or in an ætna, is perhaps even better than the salts, which represent only a part of the normal constituents of the water. After the liver has been thoroughly cleared out in this manner by a mercurial purgative followed by a saline, vegetable cholagogues, such as iridin and euonymin, may be employed to assist the action of the Carlsbad salts, when these are found to be insufficient even although they are taken with regularity. These cholagogues, the introduction of which into medicine, in this country at least, we owe to Professor Rutherford, are sometimes as useful, perhaps even more so than mercury, but as a rule I think the mercurial purgative is the best to begin with. Euonymin is the cholagogue most usually employed, but iridin is really the most powerful one, and is specially recommended by Dr. Rutherford.

Instead of trying to keep up the strength, as it is termed, by loading the stomach with food, the exhausted brain-worker should rather lean towards abstinence from food, and especially towards abstinence from alcoholic liquors. The feeling of muscular weakness and lassitude, which I have already had occasion to mention as frequently coming on about two hours after meals, is not uncommonly met with in persons belonging to the upper classes who are well fed and have little exercise. It is perhaps seen in its most marked form in young women or girls who have left school, and who, having no definite occupation in life, are indisposed to any exercise, either bodily or mental. I am led to look upon this condition as one of poisoning, both on account of the time of its occurrence, during the absorption of digestive products, and by reason of the peculiar symptoms—viz. a curious weight in the legs and arms, the

[1] *Sitzungsber. der Wiener Acad.* 1877; *Mat. Nat.* Abth. Bd. iv. p. 73.

patient describing them as feeling like lumps of lead. These symptoms so much resemble the effect which would be produced by a poison like curare, that one could hardly help attributing them to the action of a depressant or paralyser of motor nerves or centres. The recent researches of Ludwig and Schmidt-Muhlheim render it exceedingly probable that peptones are the poisonous agents in these cases, and an observation which I have made seems to confirm this conclusion, for I found that the weakness and languor were apparently less after meals consisting of farinaceous food only. My observations, however, are not sufficiently extensive to absolutely convince me that they are entirely absent after meals of this sort, so that possibly the poisoning by peptones, although one cause of the languor, is not to be looked upon as the only cause. A glass of soda-water with or without the juice of a lemon squeezed into it, may be slowly sipped when the feeling of weakness comes on, and a biscuit may be eaten along with it if desired. This will sometimes relieve languor, but if it be found insufficient, a small cup of warm but weak tea or cocoa with a biscuit will act as an efficient stimulant, although they may be less unobjectionable than the soda-water. Heat is one of the most powerful of all cardiac stimulants, and any warm fluid in the stomach will increase its action; a cup of warm water alone will do this, but it is unpleasant to take, and so something must be added to flavour it. a little claret may be used if tea disagrees, or tincture of ginger and sugar, or even some Liebig's extract. It is the local action of the warmth that we want, and in order to obtain it we may sometimes have to put up with the inconvenience of giving substances which will be to some extent injurious after their absorption, such as beef extract or even whisky. The advice that I have given here, in recommending a glass of cold soda-water or a cup of hot tea, may remind one of the countryman in one of Æsop's Fables who fell into disgrace because he blew upon the fire to heat it, and blew upon his porridge to cool it. And yet the countryman was right, for experience had taught him that the desired result would follow his actions, even though he might not be able to explain the reason why. So we find that a draught of cold water will revive a fainting person, and hot water will have a somewhat similar

effect. Both of them give relief by stimulating the circulation, but their *modus operandi* is different. In the case of the hot water the circulation is stimulated through the heart, which is excited to increased contraction, and thus the tension within the vessels is raised. In the case of the cold, the pressure is also raised, not by stimulation of the heart, but by the contraction of the vessels, especially those of the stomach and intestine. In the case of warmth, more blood is poured into the aorta by the excited heart, and where we apply cold less blood flows out of the aorta into the veins through the intestinal vessels, and thus it is that in both cases the tension is raised and the faintness removed.

At each meal it is well for the patient to begin with the solids before he proceeds to the fluids, and at breakfast, instead of beginning the meal with a cup of tea or coffee, he should finish a slice of dry toast and a piece of fish, egg, or bacon before he takes any liquid at all. The same rule should be observed at lunch and dinner. The effect of this course is that the patient is less troubled with weight and flatulence after meals. The explanation of the fact probably is that the solids, entering the stomach first, stimulate it to secretion and movement, whereas if it already contained a quantity of liquid at the time they were ingested they would not have this effect, and imperfect digestion would be the result. At dinner, wine or beer may be taken if the patient finds them agree, but in all probability he will be better without them. There are some brain-workers who require them, and must have them, but it is better for a good many others to avoid either wine or beer, and to take some effervescing water instead. Not unfrequently we hear the complaint that effervescing water is too cold, and where this is felt to be the case ginger ale or zoedone may be substituted, the colour of these beverages and their more pungent taste rendering them more grateful both to the eye and the palate of many persons. In some cases weak claret and water may be used, and if the water be somewhat warm the mixture will be better for the patients, and will not cause the feeling of coldness in the stomach, of which they sometimes complains.

A medicine which has long enjoyed a great reputation in disorder of the liver is nitro-muriatic acid, and I think

this reputation well deserved. We do not know how it acts, but in some way or another it does tend to improve the digestion. Ten minims of the dilute nitro-hydrochloric acid either before or immediately after meals, combined with some aromatic and carminative, such as chloroform and cardamoms or orange, and from five to ten minims of tincture of nux vomica where the nervous depression is great, is a most efficient remedy.

But even with all this care in food and drink, with all this attention to what is to be taken and what avoided, with medicine morning, noon, and night, how are we to keep the liver in order without exercise? Sometimes the patient may be able to take walking exercise, but when he does it is generally only for a short time during the day, and of so gentle a character that the respiratory movements are but very slightly increased, and the liver is hardly more stimulated by the pressure of the diaphragm and abdominal walls during the walk than it would have been had the patient remained quietly at home. Time is an important element in many cases. Many a hard-worked man has his day so fully occupied that he cannot give up more than a quarter or half of an hour to exercise, and it is of importance that in this limited period he should get as much exercise as possible, and the best way to employ this brief time is by taking horse exercise. I believe it is to the late Lord Palmerston that we owe the saying, that "the outside of a horse is the best thing for the inside of a man," and it is very near the truth. A brisk trot for fifteen minutes will cause more pressure upon, and stimulation of the liver than a lazy lounge of an hour or more. The time for this will depend in a great measure upon the engagements of the patient. It should not be taken immediately after a meal, and for most men whose days are fully occupied almost the only time to take it is before breakfast. A cup of milk, or a small cup of tea or coffee, with a piece of bread and butter or a biscuit, may be taken just before starting, and then the regular breakfast will be taken with greater appetite and better digestion after the exercise is over.

By careful attention to the removal of waste products, and to the prevention of absorption of poisonous substances from the intestine, by regulation of the diet, regulation of the bowels, and exercise, in the ways just mentioned, I believe that the nervous exhaustion and depression from which brain-workers suffer may be greatly diminished, even although it may not be entirely prevented.

catarrhal masses of exactly the same date is rare. The naked-eye appearances of the organ in the third stage are the following:—

It has been pointed out that fibrous adhesion of the pleuræ is to be expected in the second stage; sometimes a fibrinous adhesion at one part, and a fibrous at another. In the third stage of the disease, however, the adhesion of the pleuræ of the affected lung is almost invariably complete, and it is usually impossible to separate the one from the other, especially opposite a locality where a vomica exists. The thickening which may have taken place in the membrane is in some cases very great If a portion of the pleura should happen to be non-adherent, numbers of grey, gelatinous, and rounded nodules can be seen in it, which are freely movable with the pleural membrane. When cut into, they are found to be confined to the pleura itself; they are not catarrhal pneumonic masses which are merely pushing their way through the membrane, but are veritable pleural structures. These bodies are tubercles of the pleura, and they are usually placed in its deep rather than in its superficial layer. They are caused by absorption of caseous fluid from the cavities in the lung-substance, and their position in the deep layer corresponds to the course of the lymphatic vessels leading from the lung outwards. They are purely lymphatic tubercles, and in this respect resemble those seen in the peritoneal coat of the intestine in phthisis of that organ.

Situated on the vocal cords or adjacent mucous membrane of the larynx there are usually some similar tubercular nodules. In the tracheal mucous membrane such tubercular nodules are also occasionally seen, but not so frequently as on that of the larynx.

The mucous membrane of the bronchi is always very red and congested. Their lumina also contain a large quantity of yellow, tenacious, muco-purulent discharge, evidently partly of local origin, partly derived from the vomicæ scattered throughout the lung-substance. It is rare that the epithelium lining the mucous membrane is normal: it usually presents the appearances formerly described as characteristic of bronchial catarrh, either of an acute or chronic nature.

The apex of the lung, as is known, is the situation in which

softening and destruction of the lung-tissue usually commences. The whole of the upper lobe may be converted into one large cavity, or there may be multiple smaller cavities scattered through it. The characters of these cavities are quite distinct; their shape is irregular, sometimes rounded, or, what is quite as common, cuneiform. Their walls are very rough and nodulated, the nodulated projections being portions of caseous lung-tissue which are in process of liquefaction. Bands of a fibrous nature and of varying thickness are seen running across the cavities, and, if their points of attachment be carefully observed, it will be seen that they pass from the deep layer of the pleura, on the one hand, down to the wall of a large bronchus on the other. These are generally described as being the vessels of the lung, dissected out by the dissolution of the surrounding lung-parenchyma Now, although this is usually accepted as the explanation of these bands, it is obviously untrue; for, in the first place, there are not any vessels of this size running from the wall of a bronchus with almost undiminished calibre to the deep layer of the pleura, and, in the second place, the pulmonary and bronchial vessels have a much more disjointed course, and, even when injected, could not be dissected out in this manner. The cords are very thick, and run so directly to definite points on the inner surface of the pleura that it is evident they cannot be branches of either of the above-named vessels. When they are microscopically examined their structure is seen to be that of dense masses of fibrous tissue, with a few blood-vessels of ordinary size contained within them, and when their course and distribution are studied there cannot be any difficulty in understanding what they are. They are simply the interlobular septa of the organ, now much thickened, which, by having more power of resisting the process of destruction going on around, have been left in an isolated condition when the infiltrated lung-tissue became disintegrated. They are abundantly supplied with vessels, and hence, probably, it is that they are less easily destroyed than the infiltrated lung-parenchyma, in which the blood-supply has been gradually although completely cut off.

The cavities contain more or less viscid yellow fluid, frequently with curdy masses contained in it—the remains of the

necrotic lung-tissue. This fluid contains great quantities of granular matter and minute oil-globules. If, as not uncommonly happens, a large bronchus communicates with the cavity, then a certain number of cellular structures may also get mixed with it, being the elements of the catarrhal discharge thrown off from the bronchial mucous membrane. But if the cavity forms a shut sac, the contents are usually merely granular débris and minute oil-globules, without any great abundance of cells. The fluid is, in fact, merely the result of the liquefaction of the caseous matter formed in the second stage, and it is not pus, as might from its appearance be supposed. Should a bronchiectatic be mistaken for a true phthisical cavity, then, no doubt, large numbers of epithelial and other cellular structures will be found in it.

The lung-tissue around these cavities is usually densely packed with caseous catarrhal masses, all more or less in a state of disintegration. Besides these, however, there are occasionally to be seen small, round, grey, and gelatinous bodies, having an appearance in certain instances identical with, in others closely resembling, tubercles. Niemeyer, in his classical work [1] on the subject of pulmonary phthisis, has drawn especial attention to these, and concludes that they are tubercles in all cases. At the time his work was written the histology of tubercle was not so accurately known as it is at present, and hence, from the author not defining exactly what he means by the term, there is some difficulty in understanding how far this observation may be trusted.

There is not the slightest doubt that, in the neighbourhood of such phthisical cavities, giant-cell structures are sometimes seen. They lie in the interstitial tissue, and more particularly in the interlobular septa. They are, however, usually very small, and are so obscured by the surrounding dense infiltration, that it is almost impossible to see them with the unaided vision. The bodies that one sees so often in the surroundings of such cavities, and which have a very close naked-eye resemblance to tubercles, have not usually any true tubercular structure, but are merely isolated groups of air-vesicles filled with caseous catarrhal secretion. I cannot accept the statement of Niemeyer

[1] *Klinische Vorträge über die Lungenschwindsucht*, Berlin, 1867.

that these are all tubercles, and that the great danger to a phthisical patient is the development of tubercles. I cannot perceive what foundation there is for the latter statement. For, even in the neighbourhood of cavities where these little isolated deposits are abundantly seen, there is often not a single well-developed tubercle. How the development of such should so imperil the life of the patient I cannot see. The only explanation of this statement would be, that the tubercles interfered with the nutrition of the part, and caused its dissolution. I deny *in toto*, however, that this is the effect of the deposition of tubercle in any organ, and, on the contrary, look upon the tubercular formation as of a constructive instead of a destructive nature, leading, in the course of time, to a cirrhosis of the part. In fact, the development of tubercles in the neighbourhood of such cavities is rather a salutary than an unfavourable occurrence, seeing that, if time is given, they all develope into fibrous tissue, and conduce to the cicatrization of the cavity. Their presence, although the contrary is evidently implied by Niemeyer, is not the cause of the disintegration of the lung. They merely indicate that the neighbouring fibrous stroma is being irritated, and rendered hyperplastic by the caseous irritant carried into it. The dissolution of the lung-tissue is due to totally different causes. The tubercular development, where such exists, indicates an effort at repair.

Let us examine a little more closely the appearances presented by a catarrhal pneumonic mass when softening. It will be remembered that the catarrhal pneumonic patch is an accumulation, within certain groups of air-vesicles, of cellular structures derived from the alveolar epithelium. Both these and the walls of the air-sacs in which they are contained become granular and caseate. Previous to this the blood-supply to the affected group of air-vesicles had been gradually cut off, on account of the pressure exerted by the accumulating catarrhal cells. The parts which have caseated are dead, and therefore, the key to understanding the cause of their softening and disintegration is possessed in the following problem:—What will happen to a mass of dead, comparatively dry and compressed animal matter, if kept for a prolonged period within the tissues of a living animal, at a body-temperature, and in a

somewhat humid atmosphere, where it is practically excluded, by reason of its density, from contact with external agencies?

It has been shown by M. Duclaux [1] that, in the maturation of cheese, which presents almost analogous conditions to those under consideration, the main decomposition which takes place is that certain of the albuminoids, insoluble in water, become soluble. If then, as seems extremely likely, the insoluble albuminoids in a caseous tissue become soluble in the course of time, the cause of the liquefaction of a caseous mass can be easily explained. The cause of the absorption of these products will be also thus accounted for. It can in addition be understood how oil-globules, which previously, on account of their being bound up with the insoluble albuminoids, were almost unperceived, become abundant, and how an entire dissolution and separation of these from the now soluble albuminoid matter follows. From this it seems very clear, that the process of liquefaction of the caseous mass in catarrhal pneumonia is due merely to chemical causes, and is entirely unconnected with the mechanism of the part in which the necrosis has occurred. The question, therefore, as to whether a caseous deposit will go on to softening, or remain in its indurated state, is purely one of time, and of the chemical changes which ensue within it.

Before the softening takes place in the catarrhal mass its structure becomes very dense in the centre, and all trace of alveolar walls ceases to be recognizable. Figure 24 represents such a catarrhal pneumonic collection which has passed into the third stage. As will be noticed, there is a cavity (*a*) in the centre, whose ragged and granular edge sufficiently indicates its phthisical nature. The edge is undergoing gradual disintegration, as evinced by the remnants of the caseous matter which have become detached. The granular degeneration, due to caseation (*b*), has advanced for a considerable distance outwards into the nodule, and has destroyed the contours of most of the air-vesicles. Further out, where the caseation has been less severe, the outlines of these (*c*) are still visible. The air-sacs are compressed and stretched round the cavity, and they are filled with the granular remains of catarrhal products.

When several small cavities are so produced, the tissue

[1] *Comptes Rendus*, lxxxv. p. 1171, 1877.

separating them also disintegrates, and then the one opens into the other and a larger vomica results.

It sometimes happens, however, that a considerable portion of a catarrhal lung caseates very rapidly, and breaks down almost like a slough. In such a case the obliterated condition of the blood-vessels leading to the part, such as that shown in Fig. 25, is apparently the cause. As has been demonstrated by Friedlander and others, an obliterative affection of the branches of the pulmonary artery, such as that seen in syphilis, is of common

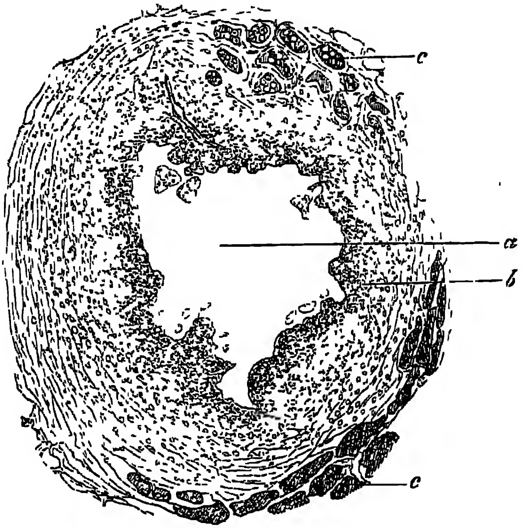


FIG. 24.—Catarrhal pneumonia, third stage, × 50 diams. *a*, the cavity formed by dissolution of the centre of the caseous pneumonic mass; *b*, the caseous edge; *c*, the compressed air-vesicles filled with caseating catarrhal products.

occurrence in phthisical lungs. The figure above alluded to illustrates this. It represents a portion of a lung taken from the neighbourhood of a phthisical cavity, and, in its centre, is shown a transverse section of a small branch of the pulmonary artery leading up towards the cavity. The lumen, or, rather, all that remains of it, is shown at *b*, its small size in all probability, having completely prevented the passage of blood. The diminution in size is caused by the thickening of the *tunica intima* (*a*), whose inordinately great dimensions are apparent.

Around the obliterated artery are several air-vesicles containing caseous catarrhal products, all in a more or less disintegrated condition. Now, when this obliterated state of the arterial branches supplied to an already infiltrated portion of lung becomes general over a wide area, it can easily be perceived how the diminished arterial supply will deleteriously act upon it, and tend to cause necrosis and disintegration *en masse.* This undoubtedly accounts for the presence of those large, rapidly formed cavities seen in certain phthisical lungs.

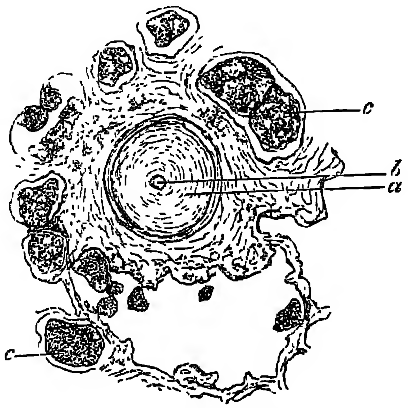


FIG. 25.—Catarrhal pneumonia, third stage, × 50 diams. Shows the obliteration which occurs in the branches of the pulmonary artery. *a*, thickened *tunica intima* of a branch of the pulmonary artery leading up to a cavity; *b*, the narrow lumen of the same; *c*, air-vesicles filled with caseous catarrhal secretion, and beginning to disintegrate.

Small aneurismal dilatations of some of the vessels are occasionally found in phthisical cavities. They are usually about the size of a horse-bean, and by their rupture cause sudden death from profuse hæmoptysis.

The question of how far it is possible for a large phthisical cavity to cicatrize is, of course, one of the greatest importance. Were it not that the lung is in reality fixed to the costal wall, by the adhesions which occur in the second and third stages of the disease, it might be possible for shrinking to occur to an extent sufficient to obliterate a cavity even of considerable size. Were the cavity situated in an organ such as the liver, for instance, it is conceivable, nay, likely, that closure of it would

ensue by cicatrization, if the débris were removed from its interior. The lung, however, is placed differently from the liver in regard to its surroundings. The costal wall being a fixed point, any cicatricial contraction in the lung-substance around such a cavity rather tends to widen than to diminish its interior. I hold it to be extremely questionable, whether a large phthisical cavity ever becomes obliterated by this means. I have never seen any *post-mortem* evidence of it. Small cavities probably do heal by contraction.

If closure is not likely to take place in a large cavity, another beneficial circumstance may and does, notwithstanding, frequently occur. The caseous material being all expectorated or absorbed from the cavity, its wall becomes fibrous from surrounding cicatrization, so as to render it no more dangerous a complication than a bronchiectatic cavity of equal dimensions. There is abundant evidence, both clinical and *post-mortem*, to show that patients may live with such a cavity, or cavities, in the lung for many years. The great danger to such subjects, is the further implication of the lung-tissue by the caseous pneumonic process, so that fresh areas of lung-parenchyma become infiltrated and destroyed.

The beneficial effects which phthisical patients experience from transference to an equable climate are, in all probability, due to there being little irritation caused by the inhaled air, and hence less liability to the excitement of catarrhal processes in sound portions of the organ. The lung has thus time afforded for cicatrization of those parts already implicated.

On a peculiar form of Catarrhal Pneumonia which is liable to be mistaken for Tubercle.

It has previously been stated that little reliance should be placed on mere naked-eye characters in determining whether a nodular deposit in the lung is tubercular or not. I propose, before concluding this series of articles, to draw the reader's attention more particularly to this, as certain significant facts presently to be mentioned have an important bearing upon

the elucidation of the etiology of many instances of diffuse tuberculosis.

A child has indefinite signs of catarrhal pneumonia, passing, it may be, into those of general tuberculosis. The lung, after death, is found to be diffusely infiltrated with nodules, certainly sometimes a little larger than tubercles, but frequently as small or smaller. They have the same grey character at the periphery as tubercles, but are occasionally slightly yellow in the centre. Their shape is a little more irregular than tubercle, and in certain instances they tend to run together. Most of them, however, are quite isolated, and occur at intervals through the pulmonary tissue, very much as in primary tubercle of the organ. There is one point about this peculiar disease, however, which is significant. There is not any evident caseous source of infection in other parts, or in the lung itself. I have seen, certainly, tubercles in other organs in such cases, but these were evidently of later date, and corresponded to deposits secondary to those in the lung as an infecting centre. The history of such cases points to this being so, the meningeal or other tubercular disturbance being the climax of the disease.

The most curious point about these deposits is that they have not the slightest tubercular structure, but, in all respects, are identical with what is seen in the second stage of catarrhal pneumonia. They are small isolated groups of air-vesicles filled with epithelial products, the group invariably caseating in the centre. Every one has exactly the same appearance; there is not a vestige of any giant-cell structure; there is nothing of an interstitial character in the nodules. The whole process is one of catarrhal accumulation in the air-sacs, followed by necrosis of the mass; and the only difference between this and ordinary catarrhal pneumonia is, in the fact of the nodules being small in size, isolated in character, and universally disseminated throughout the lung-substance.

I am well aware that, in the early stages of primary tubercle of the lung, there is a very close resemblance in the tubercle nodule to a catarrhal pneumonic deposit. Still, in all these cases where there is a distinct caseous infecting source, I have never failed to detect, in some of the older nodules, distinct and undoubted evidence of the giant-cell structure. The tendency

to organization and isolation, which form two of the most characteristic features of the tubercular as contrasted with the catarrhal pneumonic lesion, is also invariably present. The above, however, never show any tendency of this kind, and their periphery never has the sharply circumscribed border, when seen microscopically, that the young tubercle-nodule has.

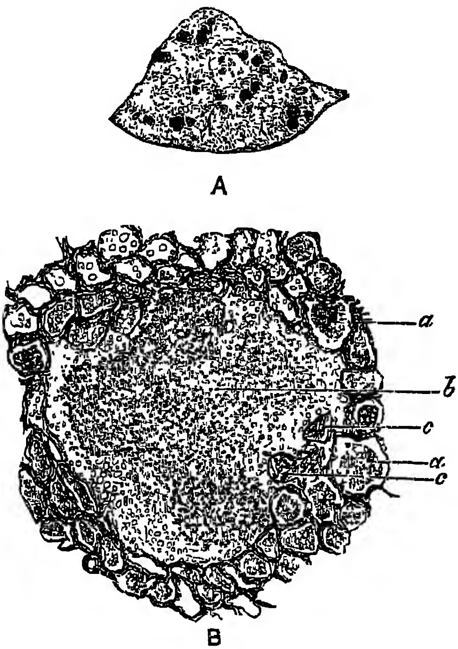


FIG. 26 —Disseminated catarrhal pneumonia. A, the naked-eye appearance of a portion of lung affected with this disease. B, one of the nodules from A, magnified 50 diams. *a a*, air-vesicles filled with catarrhal cells; *b*, the caseous centre; *c c*, the air-vesicles filled and becoming obliterated by caseation.

In order to show the characters of the two deposits, I have prepared two sets of drawings illustrating each. Figure 26 A represents the naked-eye appearance of a small portion of a child's lung with the peculiar catarrhal pneumonic deposits in it, while Fig. 27 C gives the same view of a similar portion of a lung affected with primary tubercle, both of natural size. The close resemblance between them is apparent, so that, usually, with the naked eye, it is impossible to tell whether we have to do with a

truly tubercular deposit or not. This difficulty at once vanishes when they are examined microscopically, as will be seen from the subjoined drawings of each of them, magnified fifty diameters.

Figure 26 B corresponds to the disseminated catarrhal pneumonia, while Fig. 27 D is the true primary tubercle. The

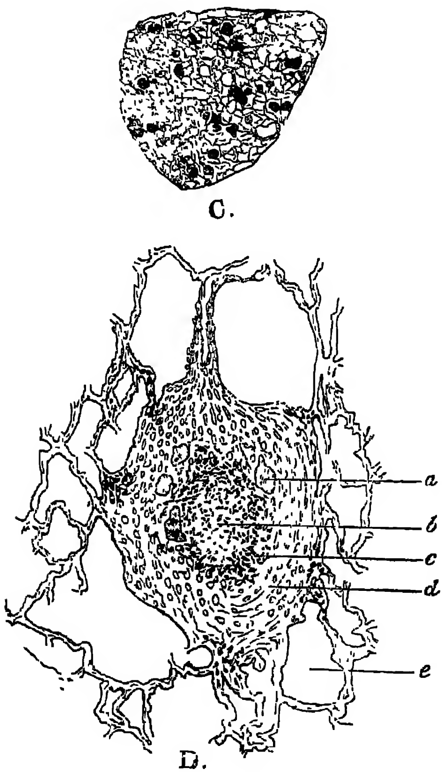


FIG. 27.—Primary tubercle of the lung. C shows the naked-eye appearance. D, one of the nodules from C, magnified 50 diams. *a*, giant-cell; *b*, centre of tubercle becoming caseous; *c*, pigment-particles contained in the nodule; *d*, cicatricial periphery; *e*, empty air-vesicles.

difference between the two is evident. The catarrhal pneumonia is an infiltrated group of air-vesicles, while the other is an organized fibrous tumour with giant-cells abundant in it.

I have been able to see how this disease commences in the lung of a child who suffered from catarrhal pneumonia after measles. There were the same miliary deposits, but in a stage previous to that in which they become caseous, and while the catarrhal secretion was as yet fluid. The wide dissemination of the catarrhal secretion seems to be due to inhalation of the catarrhal fluid during inspiration. The fluid secretion is widely scattered through the whole of the minute bronchial ramifications, and there is, apparently, not sufficient power to expectorate it. I have seen very much the same appearance produced by the sudden inhalation of blood from one of the primary bronchi. The disease, during life, presents some peculiar characters. It is usually diagnosed as disseminated tubercle of the lung; but, curiously enough, recovery from it is by no means uncommon. It must be a fact familiar to all physicians, that a certain number of persons who suffer from what is diagnosed as acute disseminated tubercle of the lung, make most wonderful recoveries, and, in a comparatively short time, are convalescent. It is in such cases that these disseminated miliary catarrhal deposits are found in the lung. It appears to be more fatal in children than in adults.

(*To be continued.*)

ON SOME POINTS IN VASO-MOTOR THERAPEUTICS.

BY JAMES MORE, M.D.

For some time back considerable attention has been paid to the physiology of the "sympathetic system," more especially in reference to its controlling power over the calibre of the blood-vessels.

Experimentation on the one hand, and a close observation of the action of remedies on the other, have made it pretty evident that so far as therapeutics is concerned, we have two kinds of actions always in force in the blood-vessels—that of contraction and of dilatation, the vaso-motor keeping the vessels in constant and physiological semi-contraction, and the vaso-inhibitory antagonising this, and bringing about, under certain well-defined limits, dilatation.

So far as our subject is concerned it matters not whether this dual action is chiefly due to the sympathetic or to the cerebro-spinal system. Suffice it, this action does obtain, and, as we shall endeavour to show, may be clinically illustrated as obtaining in the action of remedies in certain diseases and states of system.

When we take into consideration the function of the blood-vessels we are not surprised at their high susceptibility to nervous influence. And yet this physiological mode is not more remarkable than their acute responsive sensitiveness to the action of remedies. The action of heat or of cold, of amyl dilating the cutaneous arterioles, on the one hand, and the contractile power of ergot on the other, are common and forcible illustrations of the ease with which the circulation is acted on. It is not necessary for our purpose to consider how or by what

route this vaso-motor action may be therapeutically induced. It is sufficient to state that we may have it as a direct action on the peripheral arterioles, and limited in its area, or it may have a cardiac origin and be more general in its results.

Like other reflex processes it may be centripetal or centrifugal in reference to the vaso-motor centre.

Contraction of the peripheral arterioles in any given area, as the skin, must not only diminish the blood-supply to the part, but to a certain extent it raises the blood-pressure and lowers temperature, and under certain conditions slows the action of the heart. Dilatation of these arterioles, on the other hand, may flush the part with blood, lowering its blood-pressure, raising the temperature, and accelerating the action of the heart.

It is seldom the physician can lay his finger upon a case where one mode of therapeutic vaso-motor action stands prominently forward as the only factor. There is generally a to-and-fro action leading from one to the other: reaction coming into play, paresis ending in paralysis, spasm being wearied into relaxation and so forth.

But what is contended for here is, that in many well-pronounced cases, contraction *per se*, or dilatation, as the case may be, forms the initial and characteristic action, and gives a rational lead to the observant practitioner.

Taking the action of heat as a familiar example of a remedy having a direct dilating power over the arterioles, what do we find? When we apply a large poultice to the chest, the surface becomes warm, red, and flushed with increased blood-supply to the skin. The amount of blood being stable in the entire system, it follows that before this flushing with red blood can take place, there must be a withdrawal of blood from all the central organs to the skin.

It is of little importance to the practical man, whether this train of symptoms is one to paresis of the vaso-motor (or, as it is well called, the vaso-constrictor) or to irritation of the inhibitory. What is of importance is that vaso-motor action is a clinical fact, a fact of far-reaching significance and therapeutic application.

In further illustration of the importance of this subject, let

us take the state of sleep in its physiological and clinically induced aspects.

During sleep the cutaneous capillaries are in a state of dilatation, so as to ensure that degree of cerebral anæmia which the physiologist tells us is a necessity to the presence of the "drowsy god." This flushing of the skin surface with blood, with its consequent cerebral anæmia, is fostered and provided for in the warm bed-clothes, which the habit of ancestral civilised society has made almost an instinct, and stamped as a physiological necessity.

The physician, when called upon to prescribe for insomnia, meets with it in various aspects, but in a large number of instances it is due to direct or indirect hyperæmia of the brain.

He sees it in the disturbed circulation of the bilious or gouty old gentleman; in the anæmic girl or the plethoric matron; in the patient with cold feet, or in the one again with flushed face and throbbing temples. In each and all the fundamental condition of sleep—cerebral anæmia—is absent, and what is wanted is something that will unload the cerebral vessels of their surplus blood. The surplus may be due either to arterial hyperæmia, or to venous engorgement, and the skilful physician will follow the indication.

Dilate the cutaneous capillaries, and we withdraw the surplus blood from the surcharged brain to the skin. A glass of hot grog at bedtime, a foot-bath of hot water with or without mustard, a bottle of hot water to the feet, may be all that is necessary to dilate and flush the peripheral arterioles. Such in many cases act as true, safe, and scientific hypnotics.

Failing in this direction, we take to those remedies which the therapeutist tells dilate the cutaneous capillaries, and foremost and safest and most reliable amongst these we name bromide of potassium. This, with a little tension help from digitalis, forms an almost certain sleeping draught in most of the above conditions. A draught as follows might be given:—

℞ Bromid. potass. gr. xxv.
Tinct. digitalis, gtt. xv.

This failing, the addition of even so small a dose as one drachm of syrup of chloral hydrate will "make all the difference between

success and failure." Of course in many cases a slight anodyne effect is wanted to complete any special draught, and the addition of a few drops of chlorodyne or Battley's sedative, besides doing this, seems to accentuate or intensify the action of the vaso-dilators.

This was forcibly illustrated in the case of a patient I saw not long ago, where almost absolute sleeplessness had existed for some weeks, the result of mental excitement and worry. He had been taking as much as six drachms of syrup of chloral nightly without effect, and viewing it clearly as a case of cerebral hyperæmia, I prescribed the following combination, which acted at once and with marked and decided effect:—

℞ Bromid. potass. gr. xx.
Tinct. digitalis, gtt xv.
Syrup chloral hyd. ʒi.
Liq. opii. sed. gtt. v.

We do not mean to aver that such a combination acted solely on the hydraulic principle, or had no decided neurosal effect on the brain-cells, but what we hold is that its power in dilating the cutaneous arterioles, and thus providing for cerebral anæmia, is its chief *modus operandi.*

Again, all phlegmasias, more especially those accompanied by high temperature and a quick wiry pulse, denoting high blood-pressure, are relieved by the vaso-dilators. Such ailments, when at all pronounced, are ushered in by what is known as rigor. Here the blood is driven from the cutaneous surface to the centres of the circulation—the patient feels chilled and shivering, the pulse is small, hard, and thready, there is in short a high blood-pressure, the result of the internal engorgement, and more especially of the spasm of the cutaneous arterioles.

Clearly the indication is to dilate as quickly as possible these contracted cutaneous arterioles, and thus lower the blood-pressure and restore warmth to the surface.

Thus it is that aconite is so useful in tonsilitis, especially when given early in the attack, and antimony or ipecacuanha in croupous pneumonia.

We may thus, to use Professor Ludwig's expression, "bleed

the patient into his own vessels." To do this it is necessary to increase the general vascular area. All agents achieve this end which dilate the blood-vessels, as antimony, aconite, chloral, &c. The more the blood-vessels are dilated, the less the blood-pressure on the inflamed part.

Thus, in the treatment of pneumonia, the jacket poultice of the French is so valuable. The heat from this application increases the vascular area in the skin, allows more blood to stream through its dilated arterioles, and as the arterioles in the inflamed lung-tissue are already gorged with blood to their utmost capacity, the blood-pressure is lowered, not only in the part locally inflamed, but in the system generally.

We have mentioned nitrite of amyl as a good type of a remedy which acts decidedly and quickly as a dilator of the peripheral arterioles. This pronounced action is taken advantage of by the practitioner in all those ailments which seem to depend on an increased arterial tension, the result of arteriole spasm—as in angina pectoris and some forms of hemicrania.

I shall not soon forget its effect on the first case of the kind in which I tried it. A woman came into my surgery perfectly blind from the effects of neuralgic headache—a true example of Du Bois Reymond's "hemicrania sympatico tonica." Three drops of the nitrite of amyl inhaled from the palm of her hand flushed the capillaries of her face in two or three seconds, and she walked out of the surgery perfectly recovered.

But it seems this drug is likely to have a still wider therapeutic application. Besides its power of relaxing the whole arterial system and thus reducing blood-pressure, its rapid dilating power over the cerebral vessels led Dr. Kerr to employ it in the collapse arising from uterine hæmorrhage. Here fatal cerebral and cardiac anæmia were imminent, and five drops of the amyl not only arrested the alarming hæmorrhage, but averted the fatal collapse.

Such is the *modus operandi* of vaso-dilating remedies. The vaso-constricting action on the arterioles is boldly typified by ergot. In virtue of this action ergot is perhaps one of the most efficient and decided hæmostatics we possess. In large or continuous doses this action may lead up to tetany, or even necrosis of tissue. There cannot be reason to doubt that this

pronounced constricting action on the fœtal arterioles, apart from the uterine tetany it too often produces, accounts for the too frequent death of the child, when ergot is given as an aid to parturition.

Again, the therapeutic *rationale* of the large and important group of hæmostatics is undoubtedly based on the constricting and otherwise affecting the calibre of the peripheral blood-vessels. Such agents may act either directly or indirectly, and in one or other of the following ways·

1. By increasing the tone, or constricting the arterioles, as pathologically and therapeutically seen in ergot.

2. By constriction of the arterioles by muscular compression, as seen in uterine contraction.

3. By thrombosing the venous radicles or arterial capillaries, as seen in the topical action of perchloride of iron and other astringents.

4. By constricting the sarcose elements of the tissues, as in escharotics.

5. By dilating the venous radicles in arterial hyperæmia, as seen in the action of ipecacuanha, in the bloody and dysenteric stools of children.

6. By thrombosis from slowing or temporary arrest of the entire blood-current, as in nature's hæmostasia—syncope.

Nor is the physician confined strictly to one mode of blood-arrest. In the active and passive hæmorrhages, arising from engorged mucous membranes, he can choose either a vaso-constrictor or dilator. He will find small doses of ipecacuanha or arsenic, by their dilating action on the venous radicles, just as pronounced in their hæmostatic action, as in the constricting and topical action of ice in the vomiting of drunkards.

In the short compass of a paper of this kind (already I am afraid too long) a mere sketch, of course, of the more prominent features of vaso-motor action can be given.

Yet there is one question deserving our close attention, and that is the clinical landmarks which may guide us in choosing any special vaso-motor remedy.

With a large class of these remedies there is little or no difficulty. Yet it is not so with all. We have well-marked vaso-motor diseases, just as we have the remedies.

The weak vaso-motor system is often not far removed from physiological health, and in all the periodic functions, at all events, the boundary line between health and functional disturbance is being constantly overstepped.

The ovary during its monthly molimen, the uterus during the irritations of pregnancy, the stomach during its prandial excitement, the functions of secretion and excretion, the periods of growth, and the final one of decay, all point to the varied avenues through which vaso-motor disease may enter. Besides, we have often to contend with ordinary cases of disease, where our patient is heavily handicapped, simply because he inherits, or has acquired, a weak vaso-motor system.

He is "all nerves," subject to emotional excitement and great variation in his mental, as well as his physical, tone. He has an irregular or fluttering pulse, and suffers much from palpitation, indigestion, venous engorgement, and varicosity of the limbs. Besides this, he sleeps badly, or dreams most of the night, awakes in the morning to giddiness, headache, and other evils, following on a generally disturbed circulation.

This may be a sufficiently clear and *Rembrandt* picture, but it fails to cover many important states, and for ordinary clinical purposes, and as the only means of isolating (in a diagnostic point of view) such cases, our attention is forced to the following points—the degree of blood-pressure, the temperature, and lastly, the discharge of water from the emunctories.

In a clinical point of view, high blood-pressure is remarkable as indicating changes, more or less grave, in the vascular areas of the lung, liver, skin, and kidney. The two latter are for us the most important, as intravascular changes in either of these systems may at once lead to fouling of the blood from non-depuration. The retained nitrogenised waste irritates the peripheral arterioles, causing them to contract, and we have a high blood-pressure or high tension pulse.

Anything which causes contraction of the peripheral arterioles increases, in time, the functional activity of the kidney. Thus cold will increase the flow of urine; neuralgic pain, hysteria, and some emotional states, for the same reason increase the flow of pale urine.

Did this increased functional activity never go beyond

physiological hyperæmia, good and well, but it too often ends, and that in a very slow and insidious manner, in pathological hyperæmia, with thickening of the walls of the renal arterioles and disintegration of the epithelium of the renal glomeruli. The blood-current is now forced at high-pressure against the thinned and denuded basement membrane, the histolytic albumen of the blood finds its way into the pelvis of the kidney with the urine, and we have trains of symptoms called renal dropsy, albuminuria, and chronic Bright's disease.

This high blood-pressure pulse is met with in certain stages of gout, scarlatinal dropsy, peritonitis, pleurisy, meningitis, and other states where there is obstruction or resistance to the free current of the blood. This high pressure may be initiated by contraction of the arterioles themselves, when in time, as before remarked, we get thickening of their muscular walls. It may arise from sudden pulmonary congestion, or from obstruction to the portal circulation, or any cause hindering the normal elimination of waste products.

This by way of illustrating the high importance of an early recognition of the high blood-pressure pulse, and especially when associated with changes in the quantity and quality of the urine. As a vaso-motor symptom it is easily recognised, and is one of very serious import. Our whole effort must be regulated so as to relieve the blood-pressure, either by increasing the vascular area of the skin, by fomentation, poulticing, in the administration of remedies which relax the peripheral arterioles.

To be able at once and efficiently to lower the general blood-pressure is one of the most important functions of the therapeutist. By a well-timed catharsis we can at one and the same time lower the blood-pressure, the temperature, and relieve internal congestion. For the same ends and under suitable conditions we call in the group of vascular diuretics, which also well illustrate the action of vaso-motor remedies.

By these, as well as by well-chosen and skilfully-combined cathartics, we can "increase the exosmotic consequences of heightened blood-pressure, and, by bleeding the patient into his own vessels," arrive at something like a rational treatment of many inflammatory and congestive ailments.

The whole subject of temperature, both in its physiological

and its pathological aspects, can be rationally explained only on the theory of the dilatation and contraction of the peripheral arterioles. On this there is no necessity to enter, but a word might be said as to the method and time of administration of these vaso-motor remedies.

Setting aside the importance of doseage, it is certain that the state of stomach materially controls their action. Thus, according as it is given on a full or on an empty stomach, depends the probability of arsenic, for instance, acting as a vaso-dilator at all.

In gastric ulcer, depending as it so often does on thrombosis of the gastric venous radicles, and in the gastric irritation of drunkards, depending on venous congestion, and accompanied by coffee-ground vomiting, arsenic should be given before meals. It is then absorbed by the veins, and not by the lacteals, acts as a decided dilator of the engorged vessels, and thus reaches the core of the malady. Cold, again, will act either as a constrictor or a dilator of the cutaneous arterioles, according to the mode of its application. But these and other equally well-known facts seem to be so thoroughly recognised that they do not call for more than passing notice.

As a last word, and in the way of apology for this too discursive paper, I would urge the great importance of this branch of therapeutics Indeed it would seem that just as the increase or diminution of vascular areas, the result of dilatation or contraction of the peripheral arterioles, forms the rational basis of many pathological states, so does vaso-motor action cover and explain many, if not most, of our therapeutic remedies. The action of the heart, the rise and fall of blood-pressure, the rise and fall of surface temperature, the excretion of fluid and waste products from the system, the action of most purgatives, of vascular diuretics, hæmostatics, hypentics, &c., are directly under the influence of, and can only be scientifically explained on, the theory of vaso-motor action.

Reviews.

A Text-Book of the Physiological Chemistry of the Animal Body, including an Account of the Chemical Changes occurring in Disease. By ARTHUR GAMGEE, M.D., F.R.S., Professor in Victoria University, Manchester, Brackenbury Professor of Physiology in Owens College. Vol. I. 8vo. pp. 487; with illustrations. London: Macmillan & Co.

THE importance of physiological chemistry as a branch of medical science is daily becoming more and more generally recognised, and we find in all text-books of physiology a certain space devoted to it Without some knowledge of it, it is impossible to recognise such conditions as glycosuria or albuminuria, and it is from further advances in our knowledge of physiological chemistry that we may hope to gain a deeper insight into the pathology of such diseases as these, and thus in time to discover some method of successful treatment. Already we find that as a knowledge of physiological chemistry not only becomes more widely diffused amongst medical men, but becomes more precise and extensive, differences are detected in the kinds of albumen present in the urine, and some of them are being identified with albuminous bodies not usually present in the blood, but formed in the process of digestion. As our knowledge extends still further we may hope to find similar differences in the forms of sugar in glycosuria, and thus, perhaps, to distinguish between those which run a chronic course and cause little inconvenience to the patient, and those which run rapidly to a fatal termination. Cases of anæmia, also, which are so commonly met with, but which are so variable in their course, sometimes yielding rapidly to tonics, and in other cases resisting treatment, are now found, by the application of such methods as those mentioned by the author in this work, to present remarkable differences. Sometimes, for example, both the colouring matter of the blood and the corpuscles may be deficient, and at other times the corpuscles may be quite up to the average, while the hæmoglobin may be under the normal. Indeed, there is hardly any—perhaps we might more truly say

there is no disease in which questions may not arise which physiological chemistry will enable us more or less completely to solve, and thus aid either in diagnosis, prognosis, or treatment. The works on this subject in the English language which we have hitherto seen, have been, as a rule, incomplete, either treating of the whole subject in a general manner, without entering into details, or dealing minutely with only a small portion of the subject. Thus it was that any one wishing to study physiological and pathological chemistry was compelled either to have recourse to German text-books, or to read a number of English works, from each of which he could gain information on limited points which he must afterwards put together for himself.

The present work supplies a desideratum, and will, we think, enable its readers not only to obtain a clear notion of the present state of physiological chemistry, but to see the steps by which our present knowledge has been obtained, to understand the nature of the apparatus and the mode of working by which the various chemical substances dealt with may be prepared or recognised, and to grasp the connection which they have with the practical recognition and treatment of disease. Although some men may study physiological chemistry purely as a branch of theoretical science, the great majority of its students will always be medical men who have a practical object in view, and Professor Gamgee has recognised this fact in his work, and given it a very practical bearing. He has therefore classified his subjects in accordance with this object, has given special prominence to all those facts which are of the greatest interest to the biologist, and kept in the background such as possess interest only to the pure chemist. At the same time he has been careful to omit no chemical fact, or even speculation, which seemed likely to throw light on a biological question. In the present volume he has treated the chemical composition of, and the chemical processes relating to, the elementary tissues of the body, including in this classification, blood, lymph, and chyle.

This volume forms a complete and independent work, although the author intends to follow it, within twelve months, by a second volume, in which he will treat of the chemistry of the chief animal functions. He refers largely to anatomy, physiology, and practical medicine, and some may think that he has done so to too great an extent, but this has been done deliberately, and, we think, perfectly rightly. Some may think, for example, that it is out of place, in a work on physiological chemistry, to give a short account of the structure of voluntary muscle, and that all those who take up the book are, or ought to be, thoroughly acquainted with all the newest researches on the subject. But as a matter of fact readers will *not* all be

acquainted with the newest researches; and unless the author had followed the plan which he has adopted, of giving a short and clear account of the structure of muscle, many of his readers would in all probability have been unable to follow intelligently what he says about its composition. He has not, we think, wandered at all too far from his subject; but has only given enough physiology and anatomy to work them up with physiological chemistry into one intelligible whole. The volume contains eleven chapters, Chapter I. dealing with the Proteids; II. With the blood; III. Changes which the blood undergoes in disease; IV. The blood continued: description of certain methods of research; V. The lymph and chyle, the so-called transudations, normal and pathological; VI. Pus; VII. The connective tissues, including subdivisions, the changes which bone undergoes in disease, quantitative analysis of bone; VIII. Epithelial tissues or epithelium, keratin, chitin; pigments deposited in the epithelial structures; certain other animal pigments; IX. The contractile tissues; X. The nervous tissues; XI. Chemical history of certain of the peripheral terminations of the nervous system and of the accessory structures connected with them—the tissues and media of the ear, tissues and media of the eye.

Space will not allow us to enter fully into the contents of these chapters. In looking at that on the blood, we find that the author has given a most full, accurate, and interesting account of all that is known on the subject, and that he has done full justice to the admirable researches of Dr. Buchanan on coagulation. Throughout the work Dr. Gamgee has been very careful to give due credit to every discoverer of new facts, and has brought prominently forward some valuable researches which had been hitherto undeservedly neglected. The serum and its constituents, the coloured corpuscles, the colouring matter and its compounds, the gases of the blood, the hæmoglobin in invertebrata, the green and blue colouring matters of the blood in lower animals—all receive full attention. But perhaps the part which, to a medical man, will be most interesting is a description of the changes which the blood undergoes in particular diseases—anæmia, leucocythæmia, progressive pernicious anæmia, scurvy, purpura hæmorrhagica and hæmophilia, gout, articular rheumatism and rheumatoid arthritis, rickets and osteomalacia, febricula, typhus fever and typhoid fever, relapsing fever, splenic fever, intermittent fevers, scarlet fever, measles, small-pox, erysipelas, cholera, diseases of the heart, diseases of the lung, diseases of the liver, diabetes mellitus and diseases of the kidney. Some of these sections afford good examples of the method pursued by the author. In relapsing fever, for example, it might have been strictly correct,

in such a work as this, to have mentioned only the disproportion between white and red blood-corpuscles, and the presence of large masses of protoplasm and degenerated endothelial cells; but instead of confining himself to this, the author has given a clear account of the etiology of the disease, rendered still more interesting and intelligible by figures of the spirillum which causes it. The discussion, too, of the condition of the blood in diabetes mellitus is exceedingly interesting in relation to the question whether the cause of death in certain cases of this disease is fat emboli in the lung or the development of acetone in the blood. The conclusion that the author comes to is that although acetone may not be the toxic agent, death is certainly due to the action of a poison and not to a suddenly-developed nervous lesion.

The work is written in a clear, intelligible style, and the use of various kinds of type (especially the marginal annotations in thick type), renders it very easy for the reader to find any point to which he wishes to refer. We have been able to discover very few omissions indeed. The only one which strikes us is that the use of chloride of zinc is not mentioned as a means of precipitating proteids from solution. The work exhibits the greatest industry and care, and a complete mastery of the subject. We congratulate the writer on having produced a work which, so far as it goes, is the best and most convenient text-book on the subject in any language. It is certainly one which no medical man who wishes to know his profession thoroughly can afford to be without.

Index Catalogue of the Library of the Surgeon-General's Office of the United States Army. Vol. I., 4to. pp. 888. A—BERLINSKI. Washington: Government Printing Office.

THE slow progress of medical science is a matter of general lamentation, and one of the great obstacles in the way of its advance consists in the fact that, while so many men are constantly devoting their attention to it, a great part of the knowledge they acquire dies with them, and their successors begin at the same point that they began at, instead of where they left off. This is partly due, no doubt, in many cases, to their inability to communicate their knowledge, in others to their dislike to publication, and in others again, to their writings having been forgotten. It is quite extraordinary how many supposed new discoveries one finds in old books. Some years ago, when in the Surgeon-General's office at Washington, we were astonished to find, lying on a desk, a copy of Galen, placed there, apparently, not for ornament, but for use. On inquiring for what purpose

the volume was there, we were told that most of the new discoveries were to be found in it. All through the history of medicine we find the same forgetfulness of previous work, even when most discoveries were embodied in comparatively few books, so that one might have imagined that each student could become acquainted with them. Of late years it has become more and more the practice to record observations in the columns and pages of medical periodicals, and these observations thus become so numerous and so scattered that it is impossible for any individual to become familiar with them all. Even when one is studying a single subject in medicine or surgery, the labour of looking up references is enormously great, and consumes a very great deal of valuable time. It has often struck us, too, that the labour thus expended is, to some extent, labour lost, for each successive worker has to go more or less over the same ground, and we have often longed for some general index to medical literature. But the preparation of such a work is such an enormous task that very few men would dare to attempt it, and fewer still would succeed in accomplishing it. At last, however, it has been done, and we have here the first volume of an *Index Catalogue.*

In the introduction Dr. Billings calls attention to the fact that the work is not a complete medical bibliography, and that any one who relies upon it as such will commit a serious error. "It is a catalogue of what is to be found in a single collection—a collection so large and of such a character that there are few subjects in medicine with regard to which something may not be found in it, but which is by no means complete." But although Dr. Billings, with his accustomed accuracy, takes care to state what this catalogue is, and what it is not, nevertheless it approaches so nearly to a complete index of medical subjects as to be of the utmost possible value to every one who desires an acquaintance with the literature in any department of medical science or practice. "The Catalogue includes both authors and subjects, the names being arranged in dictionary order, in a single alphabet." The book does not merely give the names of authors and their productions, but, under subject-headings, it details the titles of original articles in the medical journals, and transactions contained in the library, for which reason it has been called *Index Catalogue.*

If any person will take up a single number of the *British Medical Journal* or *Lancet* and attempt to index its contents, he will be surprised at the amount of labour involved in such an undertaking; but when he considers that this work is an index, not of a single number, or a single journal, but, with comparatively few exceptions, of every number of every periodical medical publication which has ever appeared, he will be able

to appreciate the magnitude of the task as well as the inestimable benefit which its successful termination will confer upon medical science and practice. The work involved in preparing the references actually printed is very great, but perhaps even more energy has been expended in keeping others out, for the index is intended for original articles only, and not mere reprints, although occasionally important papers are indexed in several periodicals, and sometimes a reprint is indexed when the original is not in the library. The present volume, although it only extends from A to Berlinski, includes 9,000 author titles, representing 8,031 volumes, and 6,398 pamphlets. It also includes 9,000 subject-titles of separate books and pamphlets, and 34,604 titles of articles in periodicals.

Although a librarian might have found a complete separation of the catalogue of authors from that of subjects more convenient, the demand on the part of those who were to use this catalogue was very decidedly for the combination of the subjects here given. The titles selected for subjects are those for which it is presumed the majority of English-speaking physicians would look in an alphabetical arrangement. When there is doubt as between two or more subject-headings, cross-references are given.

As a rule, the references are given from general to more special heads, but not the reverse. It is presumed, for instance, that those who wish to consult the literature of "APHASIA" will turn to "BRAIN (diseases of)" or "NERVOUS SYSTEM (diseases of)" as well as to "APHASIA," without being directed to a cross-reference under the latter title.

Anonymous works are entered under the first word of the title not an article or preposition. Russian and Japanese titles are transliterated, and a translation is usually appended. Greek names are transliterated for the sake of uniformity of type The list of abbreviation of titles of medical periodicals is separately paged in order that it may be bound up for use with the succeeding volumes. Some of the names of places might have been further shortened if the catalogue had been intended for use only in America, but an analysis of subjects in so wide a collection of medical periodicals is necessarily useful in St. Petersburg as well as at Washington, and intelligibility to foreigners has therefore been regarded as a quality essential to the abbreviation in question.

To give some notion of the work, we take a single heading, "ANÆSTHESIA" for example. We find under it cross-references to Æsthesiometry, Apselaphesia, Elephantiasis, Embolism (cerebral), Eye, Hysteria, Leprosy, Metallotherapy, Nerves, and Paralysis, and under it we see, as sub-headings, Hysterical Anæsthesia, Muscular Anæsthesia, Surgical Anæsthesia, Anæ-

sthesia in the Insane, Anæsthesia from Lead. Then comes "ANÆSTHETICS," with cross-references to Acid, Amylene, Carbolic Acid, Carbonic Acid, Asphyxia, Brain, Burns, Chloride of Carbon, Chloral, Chloroform, Cold, Convulsions, Electricity, Ether, Ethidene, Ethyl, Inhalation, Kerosolene, Lycoperdon, Mesmerism, Methylene, Nitrous Oxide, Rhigolene, besides a general reference to particular operations in diseases Under this head, again, we find, as sub-sections, besides anæsthetics itself, accidents and anomalies of anæsthetics, history of anæsthetics, jurisprudence of anæsthetics, local anæsthetics, anæsthetics in children, anæsthetics in dentistry, anæsthetics in obstetrics, anæsthetics in operations of the eye, anæsthetics in sleep. Under the sub-section "ANÆSTHETICS" we find 56 books, and 260 references to names in medical periodical literature, and under one name we find no less than 17 papers.

It is almost impossible to speak too highly of a work like the present. It is a boon to medical literature such as is not conferred once in a century. We know of only one other work which at all compares with it—Haller's *Bibliotheca*, published in 1776, a little more than a century ago While the chief gratitude of the profession is due to Dr. Billings for the energy and ability which projected and carried through the work, his assistants, Drs. Yarrow and Chadwick, and especially Dr. Fletcher, must not be forgotten. Moreover, the medical profession throughout the world owes much to the United States Government for their generosity in granting the funds necessary for the publication of the Catalogue.

Index Medicus; a monthly classified record of the current medical literature of the world. Compiled under the supervision of DR. JOHN S. BILLINGS and DR. ROBERT FLETCHER New York: F. Lepoldt, 1375 Park Row. London: Trubner and Co. Paris: J. B. Baillière et fils. Leipzig: H. F. Köhler. Amsterdam: Fred. Muller and Co. St. Petersburg: Karl Röttger.

NOTWITHSTANDING the completeness of such a work as the *Index Catalogue,* it is quite evident that the weekly and monthly increase of medical literature is constantly rendering it more and more defective, so that, before many years are over, it will, to a great extent, have lost the value which it now possesses, and a new edition will be imperatively required. In order to supplement this work, and to prevent the inconvenience which would constantly increase as time went on, Dr. Billings, in conjunction with Dr. Fletcher, has started a new periodical, the *Index Medicus.* This gives the names of authors and the titles of all new medical books under their appropriate

subjects, and also complete references to current periodical medical literature. The labour involved in the preparation of such an Index as this is very great indeed, and the expense of issuing it is very considerable. A large number of subscribers is therefore required. We believe that at present its circulation is not nearly so great as its merits demand, so much so that we believe it is published at a loss, and unless more support is met with it may require to be discontinued. To medical men whose time is fully occupied with practice and who have neither inclination nor leisure to write, the *Index Medicus* would be of no direct service, and they might think it a waste of money to subscribe to it. And yet such would not be the case, for the existence of such an index enables those who have the time and inclination to write to become fully acquainted with all the literature bearing upon the subjects which they treat. The *Index Medicus* therefore becomes, indirectly, of great benefit to those who have time for reading only. It will be a calamity to the profession if this work should be discontinued for want of the support which it deserves, and we therefore hope that not only those to whom it will be of immediate use will subscribe to it, but many others who will derive from it only the indirect advantage to which we have alluded.

Clinic of the Month.

Oil of Eucalyptus.—Dr. Siegen, of Deutz, narrates some of the results he has obtained from the use of the oil of Eucalyptus globulus in antiseptic surgery. He was induced to experiment with it at the suggestion of Prof. Binz, and since 1872 has carried on his investigations of its antiseptic properties. He prepares the solution of the oil by dissolving three grams in fifteen grams of alcohol, and diluting with 150 grams of water. In this solution he soaks ordinary gauze. This dressing is applied in the wet state, covered with the usual gutta-percha tissue, and the whole kept in position by means of gauze bandages. Thus prepared the eucalyptus gauze does not appear to irritate or produce eczema, even upon a sensitive skin, and is perfectly antiseptic. Dr. Siegen has employed this dressing with excellent results on several occasions. In one case of purulent inflammation of the elbow-joint resection was performed under the thymol spray, and after washing out the wound with an eight per cent. solution of chloride of zinc, it was dressed with thymol. The discharges from the wound remained, however, offensive and profuse, whereupon the eucalyptus dressings were employed, the surfaces being first washed with a one per cent. solution of permanganate of potash. After the first dressing the secretion of offensive pus ceased, and the wound healed rapidly. Dr. Siegen's experience has taught him that a five per cent. solution of oil of eucalyptus may be employed without any drawbacks. Dressings prepared with this solution may be left undisturbed for four or five days, whilst the two per cent. solution dressings remain aseptic for three days. (*Deutsche Medizin. Wochensch.* No. 30; *The Lancet,* Sept. 4, 1880.)

The Local Treatment of Small-Pox Eruption with Carbolic Acid.—Dr. Schwimmer describes his method of applying Lister's carbolic acid paste in small-pox with a view of preventing pitting. The paste (acidi carbolici, 4·0-10·0; olei olivæ, 40·0; cretæ trit. alb., 60·0) is applied to the face upon a linen mask, with openings for the nose, mouth, and eyes—strips of linen suffice for the arms and hands. These applications are

left undisturbed for twelve hours, when fresh ones can be substituted. Suppuration is greatly shortened, and the intensity diminished. Whilst in parts without treatment the stage of desiccation appeared between the thirteenth and fifteenth day; on the face it set in on the ninth to the eleventh day. There was no excessive suppuration on the face. Upon the commencement of desiccation the mask was usually removed. Ten to fourteen days after complete desiccation the skin of the face was free from all traces of the disease, or at the most, spots of pigment were visible that gradually disappeared. (*Berlin Med. Wochensch.* May 10, 1880; *London Med. Record,* Aug. 15, 1880.)

The Antiseptic Treatment of Enteric Fever.—During a slight epidemic of enteric fever Dr. Rothe was led to make a series of therapeutic observations. Of twenty-five cases which he treated, six were subjected to a *régime* which he had employed for some years, and which had given him satisfactory results. This consisted in administering during the first days of the disease hourly doses of infusion of digitalis (one in ten), with aconite and tincture of iodine, until a distinct effect on the pulse was produced. With this he used permanent cold wrappings, quinine, or, according to circumstances, salicylic acid in large doses; and in cases of necessity, that is, where the temperature remained continually at or over 40° C. (104° F.) cold baths. Of these six cases one ended fatally in the fifth week. The patient was a girl fifteen years old; the case was complicated with double pneumonia. The remaining were somewhat protracted, four to six weeks elapsing before convalescence was established. The remaining nineteen cases Dr. Rothe treated with a mixture of one gram of carbolic acid, one gram of rectified spirit, and one gram of tincture of iodine, to 120 grams of water, a tablespoonful being given every hour, until toxic symptoms were produced, usually after two or three weeks uninterrupted administration. The cold wrappings were continued in every case until the temperature had been reduced to 39° C (102·2° F.), but no quinine was ever given. Under this treatment Dr. Rothe states that the tongue never assumed the dry, brown, hard and crusty surface which is usually a constant symptom in severe cases; whilst the gastric symptoms subsided at the latest about the beginning of the second week, being followed by moderate appetite and a feeling of comfort. The effect on the fever seems to take place sooner or later, between two and ten days, according to the intensity of the infection (general symptoms). The medicine itself is readily taken by the patients, oil of peppermint completely disguising the disagreeable smell. It seems important that the remedy should be given in sufficient quantities (one to two of carbolic

acid, and one of tincture of iodine, in 120 of water), a tablespoonful being given hourly until a decided effect on the pulse and temperature is produced, and then every two hours, until apyrexia follows; as already stated, it should be continued for three or four weeks. Whether the carbolic acid without iodine has the same effect Dr. Rothe does not know. For the last ten years he has used the combination of carbolic acid with iodine in phthisis, diphtheria, and diarrhœa, with good results. (*Deutsch. Med. Woch.*, Nos. 11 and 12, 1880; *The Lond. Med. Rec.*, Aug. 15, 1880.)

Treatment of Biliary Calculi by Olive Oil.—Dr. Kennedy states that various agents have been from time to time employed for the solution and expulsion of biliary calculi. Of these, chloroform alone or with ether is said to have removed these bodies; but this mode does not seem to have come into general use, probably Dr. Kennedy thinks because it requires time; but he believes that he has now obtained a simple medicine readily available in practice, and having the required properties. In every instance in which the calculi were proved, or presumed to have been the cause of periodic suffering, these bodies were promptly and painlessly expelled in larger or smaller numbers by the use of large doses of olive oil. The author appears to have administered the oil in six-ounce doses at bedtime. (*The Lancet*, Sept. 18, 1880.)

The Treatment of Sweating Feet.—Dr. George Thin calls attention to the cause of the bad odour sometimes associated with excessive sweating of the feet. He shows that it is due to the secretion of a fluid which rapidly swarms with a special form of Bacterium. Hebra's plan of treatment in cases of this nature consisted in keeping the skin of the soles enveloped in diachylon ointment, but this necessitates the recumbent posture for eight to twelve days, and the author recommends the following method as more easy of application:—The stockings are changed twice daily, and the stocking feet are placed for some hours in a jar containing a saturated solution of boracic acid. They are then dried, and are fit for wear again if it be desired. The boracic acid effectually destroys the smell. It is not enough however to kill the bacteria in the stocking; the leather in the bottom of the boot soon gets wet and sodden, and smells as vilely as the stocking. This difficulty is got over by the use of cork soles, several pairs of which should be procured. Of these a pair is to be worn only one day unchanged; at night they are placed in the boracic jar, and are put aside the next day to dry. If these directions be accurately carried out the evil smell is perfectly destroyed. The boracic acid solution is an excellent application to the painful skin in these cases. When the tender

skin of the soles is washed with it a sensation of coolness succeeds the feeling of heat and tension, which are the usual accompaniments of the eczematous condition associated with the smell, and the skin becomes harder, losing its abnormal redness. (*The Brit. Med. Journ.*, Sept. 18, 1880.)

The Differential Diagnosis between Laryngeal Syphilis and Laryngeal Phthisis.—Dr. Moure of Bordeaux in his graduation thesis, has carefully studied these two affections, especially in regard to their differential diagnosis, founding his conclusions upon numerous and careful observations. He divides his work into two parts: in the first of which he briefly considers other laryngeal affections, such as the diphtheritic, stridulous, œdematous, and catarrhal laryngitis, in order to show clearly the points of difference between them and the two affections specially under discussion. In considering them in the second part, he first remarks on the symptoms common to phthisis and syphilis of the larynx, and then upon those which are different in the two affections. Thus in the secondary period of syphilis we have erythema, roseola, mucous patches, inflammatory hyperplasia, paralysis and dysphonia; in the tertiary stage tubercles, syphilomata, ulcerations, caries, necrosis, and syphilitic vegetations. In the case of laryngeal phthisis, the course of which the author also divides into two periods, we meet with (1) in the catarrhal stage, catarrh and erosions resulting from it, congestion and inflammatory swelling, and aphonia; (2) in the ulcerative and necrotic period, tuberculous infiltration, ulcerations, vegetations, and lastly, œdema. These symptoms placed side by side, will aid us in drawing a sure diagnosis between the syphilitic and phthisical affections of the larynx. (*The Medical Press and Circular*, Aug. 25, 1880)

On the Employment of Catgut for the Ligation of Arteries in their Continuity.—Dr. Eugene Bæchel, of Strasburg, reports eight cases of ligature of the arteries with catgut, and from a comparison of these with other numerous cases which were reported by English surgeons (*Trans. Clinical Society, Lancet,* 1877, vol. ii) he deduces the two following conclusions: 1. That a catgut ligature properly applied obliterates in a permanent manner even large arteries. 2 That the reunion by first intention is easily obtained after these operations, provided that the rules of antiseptic surgery are strictly observed. In his own eight cases the incision of the ligature was closed in each at the end of three or four days. One of his cases left the hospital three days after ligature of the brachial: another seventy-nine years of age got up ten days after ligature of the femoral. From the moment that immediate reunion

becomes the rule, the field of surgery is wonderfully enlarged. We shall be able to approach the ligature of the subclavian artery within the scalenus, which until now has always caused death by secondary hæmorrhage, as well as that of the primitive iliacus or hypogastric. As for the ligations which usually succeeded with the old methods after more or less prolonged suppurations, we can assert that the antiseptic dressing renders them so inoffensive that they are less exhausting to the patient than simple digital compression There is no further reason why we should seek for a better agent of deligation than catgut. While it is reabsorbed after a certain number of days, it none the less leaves the artery obliterated, is a fact that has been verified too frequently to be any longer disputable. From what substance may we expect superior results? Undoubtedly silk threads or metallic wires encyst themselves sometimes in the tissues without interfering with primary reunion. But they do not disappear, or if so, only after long months, and often cause suppuration which eliminates them even more slowly. The only admissible objection to the use of catgut is that we do not always have on hand threads of this material which are of good quality. The country doctor and the army surgeon will often be obliged to do without them. Then they may make use of a silk or linen thread boiled in carbolic acid: this thread is easier to prepare, to preserve, and to transport than catgut, and it is more like it, without, however, offering the same assurance for the success of the immediate reunion. But why surgeons who are converted to the antiseptic method still reject catgut for ligatures of arteries in continuity Dr. Bæchel is unable to explain, unless it be due to the instinctive fear caused by its reabsorption. Experience and reasoning have proved equally that this fear is chimerical, and it ought not to prevent us in future from making use of this valuable agent. (*Gazette Hebdom.*, Feb. 17; March 10, 1880; *American Journ. Med. Sci.* June, 1880.)

Obstinate Epistaxis dependent on Cirrhoris of the Liver.—M. Garnier relates a case which he has observed in Prof. Verneuil's service. A robust man was admitted on account of an epistaxis which had continued for two days, having been arrested from time to time by means of the plug. Prof. Verneuil plugged the nostrils before and behind, and supposing that it might be a case of intermittent epistaxis, prescribed quinine. The hæmorrhage persisted, and ergotin given internally and injected into the nasi proved useless. Digitalis arrested the bleeding for two days, when a more minute examination of the condition of the patient having revealed the existence of cirrhoris of the liver, a large blister was applied over the hepatic

region, and the epistaxis was definitively arrested. (*The Med. Times and Gazette*, Sept. 4, 1880.)

A New Dressing for the Navel.—Dorhn recommends under this title the following arrangement in order to avoid the evil effects which occasionally follow the separation of the cord when dressed in the usual fashion. The newly-born child after having its navel-string tied and cut, is first washed in the usual manner, after which it is laid on a table and the remains of the navel-string as well as the parts round about the navel washed with a 2½ per cent. solution of carbolic acid. The cord is now tied a second time with a ligature which has been duly carbolised, and the superabundant portion of navel-string cut off with its previous ligature attached to it. A layer of carbolised wool is applied over the stump of the navel-string, and over all a portion of sticking-plaster about the breadth of the hand is firmly fastened. This dressing is allowed to remain till the seventh day without being either aired or renewed. On removing it the remains of the navel-string will be found either nearly or entirely separated. In the former case it is cut off with a pair of scissors. The author declares that he has found this dressing very satisfactory in twenty-eight cases. (*Cbl. f. Gynäkol.* No 14, 1880; *The Edinburgh Med. Journal*, Sept. 1880.)

The Hysterical Element in Orthopædic Surgery.—Dr. Shaffer's article on the above is a valuable contribution to a subject about which the general practitioner is very slightly conversant. The first case reported is that of a girl aged fourteen, who had always enjoyed good health. About five years previous to her visit to Dr. Shaffer she fell from a waggon, the lower part of her spine being hurt by the fall; a black and blue spot developing near the last lumbar vertebræ. In a few days she recovered. When about twelve years of age she commenced exercise on horseback, and after a time complained of pain in her back, but soon recovered under treatment. About three months later she was thrown over her horse's head, when the spine was again injured This time she became very nervous and irritable, complained of a tired feeling in her back on the least exertion, and also tenderness over her spine. As a distant relation had suffered from Pott's disease, the mother associated this disease with the affection existing in her daughter. The diagnosis of caries of the last vertebra was made by her physician, and she was treated accordingly, but with an increase in her symptoms. Shaffer on examination found that there were several tender spots in the vicinity of the twelfth dorsal and first lumbar vertebræ, but that there was more pain produced by slight irritation of the clothes than when deep pressure was made. There was some deformity, which dis-

appeared when the patient was lying down; the spine was normally flexible, and the psoas and iliacus muscles offered no resistance when put on the stretch, the pelvis being firmly held and the patient in a recumbent posture. The diagnosis arrived at was neuro-mimesis, chiefly because of the superficial character of the pain, and the normal movements of the spine. In another patient there had been concussion of the spine, but previous to this she had complained of pains in her back. The spine presented an apparent curvature, both laterally and antro-posteriorly. On examination it was found that the deformity disappeared when in a recumbent posture. Several points of tenderness existed over the spinous process· the psoas muscles were not contracted, and there was no muscular rigidity. In this the diagnosis had been Pott's disease, but Shaffer believes it also to have been neuro-mimesis for the following reasons: absence of rigidity of the muscles; as well as of the characteristic attitude and gait seen in Pott's disease, and of the nocturnal cry: in the true form of the disease the pain would be referred to the region where the spinal nerve from the diseased part runs. Other instances of these affections are recorded, and the following conclusions are arrived at by the writer, and given here in a condensed form:—There is atrophy due to the lesion in chronic osteitis and muscular spasm, which disappears when the patient is under the influence of an anæsthetic, but which is not affected by the administration of opium or chloral. There is also reduction of the faradaic contractility. In emotional contractions the muscular rigidity, which is variable, disappears under the influence of anæsthetics, and during sleep, whilst there is normal reaction to the faradaic current. The atrophy is only functional. (*Archives of Medicine*, April 1880; *The Dublin Journal of Med. Sci.*, Sept. 1880.)

Extracts from British and Foreign Journals.

Acute Anæmic Dropsy.—In November 1878, Dr. Clarenc observed several cases of a peculiar form of Anasarca, preceded by vomiting and purging, in the Mauritius. This disease, acute anæmic dropsy, has now become epidemic. The symptoms were anasarca of the lower extremities, often extending to the upper extremities and trunk, seldom to the face, and only in the worse cases complicated with ascites, hydropericardium, and hydrothorax. The dropsy was preceded by diarrhœa or vomiting, or both; with deep-seated pains in the limbs, epigastrium or abdomen, and was accompanied with slight fever, and in most cases by a rubeolar skin eruption disappearing under pressure, sometimes ending in petechiæ or phlyctænæ, and desquamation. The disease, sudden in its commencement, followed a chronic course, often lasting from three to six weeks, the tendency to œdema of the feet persisting after the patient felt otherwise well. The patients, generally Indians, were very anæmic, the blood watery, with marked diminution of the red blood corpuscles, and increase of leucocytes and granules. The dropsical swelling disappeared or greatly diminished during the night and increased by day, these alterations being due to position and repose. The dropsy was not only the most obtrusive, but also the most persistent symptom of the disease, and often remained after the patient was able to resume work. When permanent œdema had disappeared, a slight swelling of the feet frequently occurred after a hard day's work or a long walk. The diarrhœa, which, with vomiting, formed one of the premonitory symptoms of the disease, was naturally very severe, the motions being very frequent, and generally yellow, green, or white. It was not obstinate, however, and subsided spontaneously in a few days. The vomiting occurred in about three quarters of the cases, and was accompanied with slight nausea, and some epigastric distress or pain. The rash generally appeared about a week after the œdema, and continued for about ten or twelve days. On the trunk, thighs, and arms, it was of a measly character, but below

the knees resembled erythema The temperature was generally about 37 2 to 37·4 cent. in the morning, rising to 37·6 or 37·8 in the evening. The blood, in addition to being poor in red corpuscles, contained irregular masses of germinal matter, and vast numbers of minute, highly refracting granules. The lymphatic glands were not enlarged, and little complaint was made of pain in the spleen. The urine was seldom albuminous. The dropsy characteristic of this affection was evidently the result of the accompanying anæmia. The anæmia is probably due to the action of a poison which affected first the sympathetic system, as shown by the vomiting and purging, before which the patient as a rule exhibited no signs of cachexia. Whether the morbid cause acted directly upon the blood glands is not clear.

This disease resembles "béri-béri" in the dropsy, and acute anæmia which are common to both, but they differ in several respects. Béri-béri is frequently fatal, and was attended with obstinate constipation and distressing dyspnœa, and very commonly by paralysis, but it is not preceded by vomiting and diarrhœa, it is not accompanied by fever, nor does it present a skin eruption. In all these cases it differs from the anæmic dropsy of the Mauritius, which is consequently to be regarded as a distinct disease. (*Government Report of Acute Anæmic Dropsy.* Mauritius, 1880.)

Basil as an Antihelminthic.—Dr. Lemnos, of Buenos Ayres, applying to basil (*ocymum basilicum*) the term *albahaca*, states that its juice is a rapid vermifuge. The use of the remedy is further advocated on the ground, that it does not cause any disorder of the alimentary tract if worms be absent. About 50 grams of the juice should be administered, followed in two hours by a small dose of castor-oil. The results obtained from this remedy are as marked as those from calomel, santonin, kousso, and kamala. (*Pharmaceutische Zeitsch. f. Ausland.*)

On the Uses of Chrysarobin and Pyrogallic Acid.—In Hebra's clinic, chrysarobin has not fulfilled the expectations that were formed of it. It was noticed especially that when applied over extensive surfaces, in psoriasis, it frequently excited inflammation of the skin, and that after the subsidence of this inflammation fresh spots of psoriasis not unfrequently appeared on the very spots where the inflammatory action had been most intense. When applied to a circumscribed surface, however, the remedy acted well. On the face and head it could not be used, on account of the discoloration it produced. In other skin diseases than psoriasis, chrysarobin was not found to possess any advantages over other remedies. On the other hand, pyrogallic acid, which was first recommended for psoriasis by Jarisch, on

account of its chemical resemblance to chrysarobin, proved in Hebra's wards very useful in the treatment both of psoriasis and of other cutaneous affections. It was used in the form of a ten per cent. salve, which was applied to the affected surface with a brush twice a day. The parts were then covered with cotton wadding or linen, or, when the affected surface was very extensive, the patient was enveloped in flannel. The results were always good, but the cure was attained somewhat more slowly than with chrysarobin, except in cases of widespread eruptions, when the latter would excite inflammatory symptoms. The acid very rarely produced any local irritation, and it caused much less discoloration of the skin than chrysarobin. No symptoms of poisoning were ever observed, although the acid could always be detected in the urine. The individual psoriasis plaques disappeared under its use in from one to three weeks. Three cases of herpes tonsurans were well advanced toward recovery after eight or ten applications. In this affection the remedy is preferable to soft-soap, because it does not irritate, and to Wilkinson's salve, because it has no smell. In two cases of lupus, also, pyrogallic acid salve proved very useful. The nodules were destroyed in three days, and cicatrization was completed in from one to three weeks under the use of an indifferent ointment. Syphilitic infiltrations were also removed rapidly by the same remedy, but it proved less efficacious in epithelioma. (*Berliner Klin. Wochen*, Nov. 24, 1879; *The New York Med. Record*, Feb. 28, 1880.)

Treatment of Cancroid by Chlorate of Potash.—An interesting discussion on this subject took place recently in the *Sociéte de Chirurgie*, in Paris. M. Desprès opened it with an oral report on a memoir of M. Pilatte, of Orleans, on the treatment of epithelioma of the face by chlorate of potash. From a consideration of fifty-one cases, the author had arrived at the conclusion that the efficacy of the remedy is decided in cutaneous cancroid, but that it is useless when the process has involved the mucous membranes. Of eight cases treated by himself, five had proved successful and three were failures. M. Desprès, however, thought that there had been errors of diagnosis in the successful cases reported by M. Pilatte; that the disease, in his opinion, had not been true epithelioma, and, at all events, the cases had not been followed long enough to make sure that the cure was per mament. He believed that chlorate of potash had no curative power at all over epithelioma. M. Ferrier stated that ulcerations of the face, resembling cancroid, are often met with in old men. Chlorate of potash often does good service in these cases, but it would be dangerous to rely on it in true epithelioma. M. Le Fort cited a case of ulceration at the angle of the eye, which

was thought to be epitheliomatous. It was somewhat inflamed, and while waiting for an opportunity to operate, poultices were applied. The ulcer healed rapidly under this simple application. M. Verneuil observed that in all the cases reported as cured by chlorate of potash, the affection was not epithelioma, but polyadenoma of the sudoriparous glands. On the face, apart from syphilitic and scrofulous ulcerations, we meet with true epithelioma, or epithelial papilloma, sudoriparous polyadenoma, and sebaceous polyadenoma, this last being very rare. The diagnosis of epithelioma is easy, and it is readily differentiated from sudoriparous adenoma, the points of election for which are the alæ of the nose, the forehead, and the eyelids. Epithelioma is not modified at all by chlorate of potash; sudoriparous adenoma, on the other hand, may disappear spontaneously, or it may often be cured by poultices or by chlorate of potash. He prefers, however, to cauterise the ulcer with chromic acid, on account of the greater rapidity of the cure. M. Perrin said that the difficulty of diagnosis depended chiefly on the fact that the tumours may undergo transformation. He cited the case of a man, aged sixty years, who had a sebaceous adenoma of the alæ of the nose. This was cured in a brief space of time by acetic acid, but ten years later a true cancroid developed on the eyelid. He thought the sebaceous adenoma less rare than M. Verneuil claimed. (*Gazette Medicale de Paris*, Jan. 11, 1880; *The New York Medical Record*, Feb. 28, 1880.)

Stigmata of Maize in Urinary Complaints.—Dr. Dupont of Buenos Ayres communicates to the *Revista Medico Quirurgica* some interesting facts in relation to the therapeutic value of the stigmata. Thus,—they have a most evident action in many of the affections of the bladder, whether recent or chronic. In acute cystitis from traumatism, as well as in blenorrhagic cystitis, they produce a very pronounced diuretic effect, with exacerbation of the pains. It is, therefore, preferable in these cases to abstain from their employment. It is in gravel, uric or phosphatic, and in chronic cystitis consecutive to gravel, and in mucous, or mucopurulent catarrh, that the best results are obtained. All the disagreeable symptoms disappear rapidly,—the vesical pains, dysuria, excretion of sand particles, ammoniacal odour, and the abundant secretions, &c., &c. Retention of urine disappears under the amelioration of those symptoms; but the employment of the catheter ought occasionally to be continued should the bladder not completely empty itself. Several of the patients observed had used the customary remedies,—as turpentine, tar, mineral waters, &c. The stigmata of maize have produced good results when the means previously used had not benefited. It may be useful in certain cases to

employ at the same time with the stigmata the external measures indicated by the pathology,—vesical irrigations with much water, by the double-current catheter, also injections of solutions of tar, borax, silicate of soda; those of bicarbonate of soda if the urine be acid, or those of benzoic acid if it is alkaline. Besides their effects in bladder affections, the stigmata produce the best results as a diuretic, entirely harmless though very energetic, in heart affections, albuminuria, and in general in all cases in which ordinary diuretics are indicated. We have known numerous cases in which the urinary secretion has trebled or quintupled in the first seventy-four hours, and others in which the medicine has been continued two or three months without any untoward result. It is to be stated that the diuretics most in use, as nitrate of potassa, digitalis, squills, &c., are not always convenient, or without risk. (*The Canada Lancet*, May 1, 1880.)

Treatment of Burns and Scalds.—One of the best, but least known, agents for the treatment of burns and scalds is oil of peppermint Applied by pencil or cloth to the wound, it gives prompt ease from pain, and leads to a rapid cure, without scars. Previous to its application the burnt part may be kept under water. It is sometimes advisable to dilute the oil one half with glycerin. (*Allgemeine, Wiener Zeitung; American Practitioner*, April, 1880.)

Treatment of Acne Vulgaris by Scarification and by Black Soap.—Dr. Sesemann, after pointing out the frequency with which acne vulgaris occurs, its long duration, its tendency to extend and to recur, considers briefly its clinical characteristics. It occurs most frequently between the ages of sixteen and forty. The disfigurement which it produces is such as to amount almost to deformity, and this in girls. Hebra believes that it is a more obstinate affection than even eczema For several years Sesemann has employed a plan of treatment which has yielded excellent results, and which is a combination of the various methods used by Hebra, Auspitz, and Ellinger. In mild cases, where the eruption is limited, lotions with sulphurous or mercurial washes (Kumrenfeld's wash, or Gowland's liquor) are sufficient. When the inflammation has passed from the sebaceous follicles, however, to the surrounding cellular tissue, tumours of the size of a hazel-nut, or it may be of a chestnut, are found, from which sebaceous material is exuded for a long period, and which leave on healing cicatrices and frequently pigmented indurations, which are very difficult to get rid of; under these circumstances the excretory duct of the gland which is blocked by the excessive secretion acts as a foreign body to the surrounding parts. It is therefore absolutely necessary to

render it permeable, or to cause a return of the secretion if it has been arrested. With this end in view, the author removes as far as possible all sebaceous and epidermic detritus, by means of an ivory or mother-of-pearl instrument which resembles a "folder," with delicate rounded edges. By pressing upon the two sides of the duct with this instrument the sebaceous material is made to escape, and the affected part is then scraped lightly with a sharp spoon. When the inflammation is deep seated, an incision is to be made with a bistoury, and the pus evacuated by pressure, since if this precaution be neglected the eruption quickly reappears. Any small hæmorrhages which may occur are readily controlled by the use of salicilated wadding. Some patients, especially women, object to this method of puncture, but the operation causes so little pain that when it has once been performed the subsequent pricks are borne without fear. After the puncture and the scratching have been finished, the face is carefully explored with the pulp of the index finger, to discover if possible any suppurating points which may have escaped notice. The acne spots are distinguished by the fact that they are not soft, and that they do not fluctuate, as well as by their brownish-red colour, which appears to invade the surrounding skin. After the surgical treatment is complete, poultices and lotions should be applied. The surface should be first thoroughly cleansed with soap, after which an ointment, composed of one part of spermaceti mixed with three parts of fat, should be applied. In the evening, after the reaction of the skin has disappeared, the acne spots are to be covered with a paste of sulphur, glycerin, and potassium carbonate, which is left on all night, and should be removed from the larger points as soon as any symptoms of ulceration or inflammation show themselves. As soon as the face has become smooth again, brisk friction is to be made, at first with soap alone, but afterwards with soap and sand; it is best to rub the face with black soap dissolved in water and mixed with fine white sand. The treatment appears cruel, but it is generally well borne, and affords great relief to the patient. The redness of the face rapidly disappears, especially if the liniment mentioned be employed, but it is well to apply diachylon from time to time, and to leave it on all night. After the treatment is finished the patient should for a long time continue to use the lotions and apply the liniment. Dr. Sesemann frequently mixes chrysophanic acid with his paste, since he prefers it to sulphur as being less irritating to the skin, and because it does not leave behind it brownish marks. (*St. Petersburg Medicinische Wochenschrift*, No. 21, p. 206.)

The Use of Nitrous Oxide Gas in certain Diseases of the Nervous System.—Dr. Hamilton has made use of

nitrous oxide with considerable success in many cases of depression of spirits, insomnia, neuralgia, melancholia, and hypochondriasis, and he considers it as a nervous stimulant of great power. The gas was found to increase the activity of the heart and the arterial tension, the temperature was not very much disturbed, though one of the good results usually produced by it was an increased warmth of the extremities. On account of the exhilaration of spirits which it produced, nitrous oxide was of great service in many nervous and mental disorders, and under its influence taciturn and melancholic patients had often become cheerful and contented. In melancholia dependent on disturbance of the menstrual function, as well as in various forms of hypochondriasis, it had also proved of great service. As a rule it was found that two gallons of the gas mixed with one gallon of air was sufficient, but in some cases as much as four gallons of the gas were required before any symptoms whatever were produced. When there was any tendency to mania present, it should never be given, as it either proved negative in its results, or else aggravated the condition,—the latter being more frequently the case; nor ought it to be used in any case where there is organic disease of the heart. It was also contra-indicated whenever there was a plethoric state of the system, on account of its effect in increasing arterial tension. In anæmic conditions, on the other hand, it was frequently of the highest service. In a case of amenorrhœa (without appreciable disease of the uterus) accompanied by very severe headache, it had acted most happily; and in several cases of sick-headache it had not only successfully broken up the attack, but had also had the effect of preventing a return of the trouble. So in hemicrania, facial neuralgia, and sciatica, as well as in many cases of insomnia, it had also proved very useful. When given for the relief of the latter condition it had been found best to administer the gas in the middle of the day, instead of just before retiring. In cases of insomnia where there was cerebral hyperæmia, however, it was contra-indicated, as would naturally be supposed from what had been previously stated of its effects. Those suffering from functional heart trouble, and chlorotic young women, were very apt to be much benefited by it; and the same was true of individuals who had used tobacco to excess. Finally, a very useful application of the gas was in the case of those addicted to the use of alcohol or opium, and who had been induced to give up their accustomed stimulus. (*Boston Med. and Surg. Journal,* May 13, 1880.)

On the Subcutaneous Injection of Quinine.—The majority of practitioners agree with Liebreich that the hypodermic injection of quinine sulphate in any of the various forms in which it has been recommended is painful, whilst the results obtained

are not sufficiently favourable to warrant its frequent employment. Professor Kobner, however, considers that the hydrochlorate of quinine is better suited for this purpose, not only on account of its greater solubility, but because it contains a larger proportion of the base than does the sulphate of quinine, whilst the solubility of the preparation is greater in pure glycerin than in water. Thus Professor Kobner has obtained as good results in cases of intermittent neuralgia and other affections for which quinine is usually prescribed, from the injection of 0·12—0·15 grăm of quin. muriat, as are ordinarily obtained from the administration by the mouth of much larger doses (0·6—1·25), whilst the patients did not complain of any constitutional or gastric symptoms. The author gives the following as his formula for four injections:

Quinin. hydrochlor. 0 5-1·0.
Glycerin.
Aq: destill. ãã 2 0.
Disp: sine acido.

—*Der Practische Arzt,* March, 1880.

Spirochæta Obermeieri.—In two examples of recurrent fever Dr. Rudolf Albrecht could only find three examples of spirochæta in the blood. After the preparation had been left for six hours the number of these bacteria had increased, several being visible under the microscope in each field, and all moving actively. During the remissions the blood was examined daily, no organisms being at first visible: after the preparation had been left for some days in a moist chamber, however, they suddenly showed themselves at a somewhat later period than would correspond to the patient's exacerbations, and they appeared to develop somewhat more slowly in the preparation than in the living blood. Dr. Albrecht noticed that the spirochæta did not disappear after the death of the patient, for he found them in large numbers in the corpse, though they were motionless.—(*St. Petersburg Med. Wochenschr.* 1880; *Med. Chir. Rundcshau,* April, 1880.)

Bibliography.

Lehrbuch der Geschichte der Medicin u. der epidemischen Krankheiten. Von Prof. H. Haeser. 2 Bd. 7. Lfg. 8vo. pp. 817-960. Jena: Fischer.

Grundriss der Vorlesungen üb. Pharmacognosie d. Pflanzen- u Thier experimenteller Grundlage bearb. Von Dr. A. Wernich. 8vo pp 258. Wien: Urban und Schwarzenberg.

Chemisch-physikalische Analyse der verschiedenen Milch-Arten u Kindermehle unter besond. Berüchsicht. der Hygiene u. Marktpolizei. Ein Buch aus der Praxis f. Chemiker, Apotheker, Aerzte, &c. 4 Tab u. Analysen. Von Dr. Nic. Gerber. 8vo. pp. 90. Bremen: Heinsius.

Handbuch der Arzneimittellehre. Von Prof. Dr. H. Nothnagel und Prof. Dr. M. J. Rossbach. 4te Aufl. 8vo. pp. 848. Berlin: Hirchwald.

Practical Histology and Pathology. Heneage Gibbes, M.B. 8vo. pp. 107. London: H. K. Lewis.

Hygiene of Catarrh. Thos. F. Rumbold, M.D. 8vo. pp. 174 St. Louis: Geo. O. Rumbold & Co.

Diseases of the Ear. W. B. Dalby, F.R.C.S, &c. 2nd Edition. 8vo. pp. 229. London: Churchill.

Osteotomy, with an Inquiry into the Ætiology and Pathology of Knock-knee, Bow-leg, and other Osseous Deformities of the Lower Limbs. Wm. Macewen, M.D. 8vo. pp. 181. London: Churchill.

On Atrophy of the Stomach and on the Nervous Affections of the Digestive Organs. S. Fenwick, M.D. 8vo. pp. 187. London: Churchill.

Contributions to Orthopedic Surgery and Lectures on Club Foot. Joseph C. Hutchinson, M.D. 8vo. pp. 121. New York G. P. Putnam's Sons; London: Trübner and Co.

*** Any of the foreign works may be procured on application to Messrs. DULAU, of Soho Square, W.C.; WILLIAMS and NORGATE, of Henrietta Street, Covent Garden, W C.; or BAILLIÈRE, of King William Street, Charing Cross.

PUBLIC HEALTH ADMINISTRATION:—THE REPORT OF THE LOCAL GOVERNMENT BOARD.[1]

THE Ninth Annual Report of the Local Government Board has appeared. It refers to the twelve months ending the 25th March, 1880 (the official financial year), and is divided, as usual, into three parts, the first relating to the administration of the laws concerning the relief of the poor, the second to the administration of the laws affecting Local Government and Public Health, the third to the returns of Local Taxation. A bulky Appendix follows the Report, giving various circulars and memoranda issued by the Board during the period to which the Report refers, accounts of inquiries, tabular returns, &c.

Our interest in the Report rests with the second part, and of this we propose to give a brief summary, with the object of indicating the state of the public health administration of the kingdom from the point of view in which it is approached by the Local Government Board as the Central Public Health authority.

During the financial year, ending the 25th March, 1879, the expenditure of the urban sanitary authorities of England and Wales was 18,663,757*l.* and that of the rural sanitary authorities 445,517*l.* The outstanding loans of the urban sanitary authorities amounted, on the 25th March, 1880, to 56,591,080*l.*, of rural sanitary authorities, to 445,517*l.* By far the larger proportion of these vast sums of money have been expended directly or indirectly in sanitary works, particularly in works of sewerage

[1] *Ninth Annual Report of the Local Government Board*, 1879-80, 8vo. pp. 723. The Queen's Printers.

and of water-supply. Parliament itself has authorised the principal part of this great indebtedness; but the Local Government Board has large powers under the Public Health Act, of sanctioning the borrowing of money by sanitary authorities. The Report gives some interesting particulars relative to the exercise of these powers. Since the formation of the Board in 1871, it has sanctioned loans to sanitary authorities amounting to 18,824,168*l.* Of this large sum, 14,937,310*l.* were approved for sanitary improvements in urban districts, other than schemes under the Artisans and Labourers Dwellings Improvement Act, and 1,176,045*l.* for improvements in rural districts; 1,840,979*l.* were sanctioned for purposes of the Artisans and Labourers Dwellings Improvement Act, 1875; and 444,000*l.* were sanctioned for sewerage purposes proposed to be carried out by Joint Sewerage Boards. Of the loans sanctioned by the Local Government Board during the past year, amounting altogether to 3,308,032*l.*, the following sums were required for water-supply, sewerage works and sewage disposal, and street-improvements respectively: Urban Sanitary Authorities, water-supply, 293,880*l.*; sewerage and sewage disposal, 1,088,819*l.*; street improvements, 758,423*l.*:—Rural Sanitary Authorities, water-supply, 75,473*l.*; sewerage and sewage disposal, 191,097*l.*; street improvements, 750*l.*

The further experience of the Local Government Board, it is gratifying to learn, has confirmed it in its conclusions, previously expressed, as to the inexpediency of employing District Medical Officers as medical officers of health, each acting officer within the area assigned to him as a poor-law medical officer. On this important question the Board observes:

"During the past year we availed ourselves of such opportunities as occurred for urging upon sanitary authorities the desirability either of combining with adjoining sanitary authorities in a joint appointment for a considerable area, or, where that is impracticable, of appointing one medical officer of health only for the district within the jurisdiction of the authority, and, in the latter case, of selecting for the office a medical practitioner free from the calls upon his time entailed by the performance of duties under the poor-laws. It is satisfactory for us to be able to state that, in many cases, sanitary authorities have recognised the force of our objections, and have made arrangements in accordance with the views which we expressed to them as the result of our experience. We shall not fail, as opportunities occur, to urge upon the sanitary authorities the adoption of a similar course; continued observation having led us to the conclusion that the appointment of medical officers of health for large areas tends to the efficient administration of the sanitary laws."

Passing over the portions of the Report which refer to the operations of the Board with regard to the issue of provisional orders, the repeal and alteration of Local Acts, the alterations in the boundaries of districts, defaulting authorities, the constitution of port sanitary authorities, and the coming into force of the Public Health (Water) Act, 1878, the Public Health (Interments) Act, 1879, Canal Boats Act, 1877, &c., we come to the observations on the operation of the Sale of Food and Drugs Act, 1875. These are extended and full of interest.

During the year a considerable number of authorities availed themselves of the advantages to be derived from a compliance with the provisions of the Act in regard to the appointment of an analyst. At the close of 1879, the authorities who had appointed analysts numbered 237, including the greater number of the county authorities and a considerable number of the municipal corporations to whom the Act applies—namely, the corporations of boroughs which have separate Courts of Quarter Sessions or separate police establishments.

The entire number of analyses made by the public analysts during the year was 17,049, exceeding by 850 the number made during the previous year. The number would, no doubt, have been still larger had it not been for a doubt which had been suggested as to the meaning of the words "to the prejudice of the purchaser," in the sixth section of the Act. It had been contended that samples purchased for analysis did not fall within the construction of these words. Eventually the question was set at rest by a decision of the High Court of Justice, which ruled that the words in question did not defeat the object that the Act had been obviously intended to secure. This decision of the High Court was subsequently embodied in an Amendment Act.

Of the articles submitted to analysis, spirits other than gin [30·8[1]], and gin [21·7] furnished the largest proportion of samples, and other articles occupied the following order in the scale of adulteration proceeding from the highest to the lowest: drugs [27·8], milk [19·4], mustard [19 0], coffee [18·9], butter [13·0],

[1] The figures in brackets refer to the percentage of adulteration of the samples examined.

wines [10·7], bread [7·3], pickles (including tinned vegetables), beer, confectionery, sugar, flour, &c. [6·0 and under].

The percentage of adulteration which had been 19·2 in 1877, and 17·2 in 1878, fell to 14·8 in 1879. But, it is observed, that some of this diminution is more apparent than real; for it is due to the fact that the standard of strength for spirits fixed by the Sale of Food and Drugs Amendment Act is considerably lower than that previously adopted by public analysts in general, and thus many samples which would have figured as adulterated in 1878, appear as genuine in 1879.

The observations of the Report on the adulteration of some of the articles adulterated are so important that we shall give them largely in detail.

With regard to *milk* the Report says:—

"About one-third of the whole number of samples examined were of milk, and we are glad to find that the improvement which we noticed last year has been continued, though by no means to the extent that we desire. The percentage of adulteration has sunk from 21·6 in 1878, to 19·4 in 1879, and in the Metropolis from 25·4 to 23·3.

"The proportion of adulterated samples of milk varies much in different districts. As regards the Metropolis, we find that in Hackney 19 samples out of 46 are reported as adulterated; in Fulham 17 out of 42, in St. Pancras 33 out of 93; in Kensington 13 out of 46; in Paddington 16 out of 66; while of 67 samples procured in St. James's, Westminster, and of 22 samples procured in Limehouse, all are pronounced genuine. As regards the large provincial towns, we find that Birmingham has the enormous proportion of 37 adulterated samples out of 62 examined; Manchester 18 out of 52; Liverpool 32 out of 160; Bristol 50 out of 240; Sheffield 3 out of 23; and Leeds 2 out of 34.

"It would be interesting to learn how far these differences accurately represent the relative advantages and disadvantages of the respective districts as regards milk supply, and to what extent they depend on the system of procuring samples, or on other conditions. Sometimes, indeed, science is called to the aid of the adulterating milkman, as in the case of a sample where just such an amount of sugar had been added as would bring the sample up to the specific gravity of genuine milk; or where an alkali had been introduced to conceal the badness of milk that had become sour. Generally, however, water alone is employed, sometimes with profusion, sometimes in just such quantity as to reduce fairly rich milk to a fluid which it is hoped may at any rate pass as the product of ill-fed cows. Thus one sample examined by the analyst for Southampton contained no less than 48 per cent. of added water, while another, examined by the same analyst, was apparently of rich milk skilfully reduced to the limit. And the fact, to which we referred in our report of last year, that the present state of science does not enable analysts to distinguish with certainty exceptionally poor, but genuine, milk from originally rich milk to which water has been added, no doubt prevents them from reporting against many samples which there is much reason to believe have been thus tampered with. In the interest of the

public it is desirable that in those instances where the milk is so far below the average strength as to give rise to suspicion of its having been watered, but to suspicion not amounting to certainty, further samples of the milk sold by the same person should from time to time be taken and submitted to the analyst . . . . But in the majority of cases entered as adulterated in the return it would seem that the addition of water has been very freely made; and the entire money loss sustained by the consumers, to say nothing of the loss of nutriment, must amount in the aggregate to an enormous sum.

"Anything like an exact estimate of such loss is of course out of the question. If, however, we assume that in London each person consumes only a pint of milk weekly, or rather over half a quarter of a pint daily (and this, considering that over one-eighth of the entire population consists of children under five years of age, is probably a moderate estimate), the yearly consumption in the Metropolis[1] alone will be found to amount to nearly twenty-three million gallons a year, representing, at 5*d.* a quart, an expenditure not far short of two millions sterling. If nearly a quarter of this milk be adulterated with about 16 per cent. of added water (and this seems from the analysts' reports to be the average proportion), it follows (on the hypothesis that the samples analysed are fairly representative of the entire supply) that Londoners are paying between 70,000*l.* and 80,000*l.* a year for water sold under the name of milk. This unremunerative outlay might certainly be diminished with advantage, by the more extended use of the Sale of Food and Drugs Acts.

"It may be further observed that persons who adulterate are not likely to be very particular as to the quality of the water which they use for the purpose; and this is the more important, considering the part which water has frequently been shown to play in the dissemination of infectious disease. It is to be hoped, therefore, that in districts in which the Act has hitherto been allowed to be inoperative, active steps will be taken to check the adulteration of this article of universal consumption."

The use of so-called "butterine" as a substitute for butter appears to be enlisting a good deal of attention on the part of public analysts. This article, known also in the United States as Bosch and Oleo-margarine, is, when properly manufactured, made from beef fat. It would seem that now 6,000,000 lbs. of "Oleo-margarine" are exported annually from New York, chiefly to Rotterdam, Hamburg, and Bremen. There it is mixed with milk and colouring agents to give it a resemblance to butter, is then churned and converted into butterine, and re-shipped, the greater part for this country. Considerable differences of opinion

[1] "Through the courtesy of the various Railway Companies we have received returns from which it appears that the quantity of milk brought to London by railway now amounts to nearly twenty million gallons annually. If we assume three million gallons as produced within the Metropolitan area, or brought thither otherwise than by railway, the entire consumption would correspond with that estimated in the text. We cannot find that any statistics on this subject have been previously collected."

exist as to the wholesomeness of this article, some stating that they have found it infested with parasitic organisms, which may be transferred in a living condition to man; others (and among them the New York Board of Health) asserting that it is a good and wholesome food. In this country a public analyst of high reputation is of opinion that "the public should know that genuine butterine, which can be purchased at less than one shilling a pound, is often more palatable and more digestible than the inferior Canadian and other butters, which are washed up and prepared for the English markets, and sold at a little higher price." But as in the case of butter, so in that of "butterine," the adulterator plays his part, and the genuine has to be discriminated from the fraudulent article.

As regards *drugs* the observations of the Report deserve special attention.

"We regret to find that drugs continue to be largely adulterated, no less than 171 samples being reported against out of 613 submitted to analysis. One result of adulteration of drugs is that a person habituated to the use of a certain medicine in an adulterated state may be seriously affected by suddenly taking the genuine article. Thus 'paregoric' is a popular domestic medicine, practically identical with the officinal preparation formerly called compound tincture of opium, of which opium is the leading ingredient. Certain samples, however, of so-called paregoric which were analysed in Derbyshire, contained no opium whatever, and large doses might be habitually taken without producing the sedative effect desired, whereas if the patient were suddenly supplied with genuine paregoric, and were to take it in the quantities to which he had been accustomed, the change might be attended with unexpected and possibly disastrous results. Similarly, in the case of sweet spirits of nitre some samples were found entirely destitute of the nitrous ether which is the most important constituent of the real compound, and others were diluted with amounts of water varying up to 40 per cent. of the whole. Cream of tartar has been found largely mixed with sulphate of lime; and tartaric acid with lead in quantity sufficient to injure health. Fluid magnesia has been reported to have only 3·3 grains of magnesia per fluid ounce instead of the 5 grains which is the proper proportion; and tincture of rhubarb bought at one shop has been found of scarcely more than half the strength of that bought at another. We must repeat the opinion which we have expressed in former years, that this state of things demands serious attention, and that strong efforts should be made to secure the sale of genuine drugs of proper strength."

Entering upon the consideration of the sanitary work of the Board during the year, the Report first refers to the loss sustained by the Board and the public service by the resignation from failing health of the late medical officer, Dr. Seaton, which

was soon followed by his death. "Dr. Seaton," says the Report, "had for nearly twenty years devoted his entire energies to the sanitary service of the State, and it is worthy of especial record that the organisation of the present successful system of public vaccination in this country is in great part due to his labours. It should be added that Dr. Seaton was selected to represent Great Britain at the Sanitary Congress convened in the year 1874 at Vienna, which had an important influence in settling the principles of international hygiene."

Following upon this reference to Dr. Seaton, the Report describes the existing state of public vaccination in the kingdom as estimated from the returns of the vaccination officers appointed under the Act of 1871. These returns are now completed for the year 1877, and the general result is thus stated:—

"The returns afford conclusive evidence of the efficiency with which, on the whole, the machinery established by the Vaccination Acts of 1867 and 1871 is working. It will be seen that of 887,947 children whose births were returned by the several vaccination officers of England and Wales as having been registered in 1877, more than 86 per cent. had, at the time of closing the returns, been registered as successfully vaccinated; nearly 9 per cent. as having died early and unvaccinated; and a minute fraction (013 per cent.) as having contracted small-pox without being vaccinated. A further small proportion (about 0·1 per cent) was certified as 'insusceptible of vaccination' in consequence of the operation having been three times performed without success; and in these cases the parents would be exempted from any further liability to penalty under the Vaccination Acts, although the children would be as liable to take small-pox as if no attempt had been made to vaccinate them. The returns further record cases, amounting to 0·75 per cent. of the whole, in which vaccination was temporarily postponed on account of the children's state of health. The proportion of children not coming within the above categories amounts to about 3·8 per cent. of the whole, the large majority being cases which, on account of the removal of the parents after the registration of the births, the vaccination officers were unable to trace. No doubt such cases are especially numerous in years when, as in 1877–8, trade is bad and there is much movement of labourers from place to place, sometimes in search of work, sometimes in search of cheaper quarters.

"It thus appears that of the entire number of children born, only about 4½ per cent. remain unaccounted for, as regards vaccination, in the returns. This proportion is larger by a small fraction than that of the children similarly unaccounted for in 1876, but is smaller than in previous returns, the percentage in the six years 1872-77 being 5·1, 4·8, 4 8, 4·7, 4·3, and 4·5, respectively. Making allowance for a not inconsiderable number of cases in which children have been vaccinated, although the vaccination has not been certified, or the certificate has not been registered, and for those in which vaccination, postponed at the times when the returns were made up, has been subsequently performed,

we may safely assume that the proportion of children born during those six years and now living without protection against small-pox, is considerably less than 4 per cent."

The following observations with reference to the Metropolis throw so much light upon the operation of Vaccination laws that we give them in detail :—

"It is in the Metropolis, as usual, that the largest percentage of children escapes vaccination. No doubt this is to be ascribed, for the most part, to the migratory habits of certain classes of the population. A birth at a particular house is registered, but before the time arrives for the vaccination officer to make personal inquiries with a view to securing the child's vaccination, the parents have removed to another district, perhaps only to another street, but they have left no address, and they are not traced. Nothing short of a house-to-house inspection of the whole district, at short intervals, would be thoroughly effectual in dealing with this sort of default, and there are obvious difficulties in carrying out such a measure as part of a system. Much, however, depends on the promptitude and activity of the vaccination officer, and it is found that if, owing to any circumstances, the work is once allowed to drift into arrear, it is exceedingly difficult for him to make up lee-way. There is an enormous difference between the results achieved by a vaccination officer who deals with each case of default as soon as it arises, and those attainable by one who only seeks for the children when they are seven or eight months old. On reference to the returns for individual districts it will be seen that among others St. George's-in-the-East and Shoreditch are conspicuous as showing a large proportion of default. We understand that in St. George's-in-the-East this is in great measure due to the serious illness under which the late vaccination officer laboured for some time before his death, and we are glad to find that the provisional returns recently received from his successor show substantial improvement. In Shoreditch the vaccination officer has had to contend with special difficulties, as a very large number of houses in the most densely populated part of the district has been demolished, and the inhabitants have scattered themselves in various directions. In Hampstead the late vaccination officer, whose returns for 1877 show considerable default, was in infirm health, and the provisional returns received from his successor have been fairly satisfactory. In Whitechapel the vaccination officer had to be replaced by a more efficient officer, whose provisional return is excellent. In Marylebone a not inconsiderable proportion of the default is due to a lying-in hospital from which children are taken away soon after they are born, and cannot subsequently be traced. The guardians have now arranged for a weekly attendance of the public vaccinator at this hospital, and it is hoped that this measure may to some extent lessen the number of cases escaping vaccination in future. In several metropolitan unions it will be seen that the returns leave little to be desired. In Lewisham, where the vaccination officer is exceptionally zealous and energetic, only a little more than 2 per cent. are left unaccounted for out of the number of children born; and in Poplar, Wandsworth, St. Olave, Hackney, Westminster, and Fulham the proportion is less than 5 per cent. We should be glad to see at least equally satisfactory results attained throughout the Metropolis, and we hope to secure improvement by changes of arrangements where necessary, and by prevailing on Boards of Guardians to appoint vaccination committees or to take other means for actively supervising the work of the vaccination officers.

"It is obvious that an annual addition to the population of London of something like 9,000 children of whose vaccination there is no proof must, so far as they really are unvaccinated, constitute a serious danger, and widen the field of small-pox epidemics; and we shall spare no pains to secure better results."

With reference to Provincial Vaccination returns, it would appear that in three out of the eleven divisions of England the proportion of cases unaccounted for as regards vaccination is less than 3 per cent., and in only two (besides the Metropolis) does it amount to 5 per cent.

The sum awarded to public vaccinators in 1879, in recognition of the excellence of the work done and the careful observance of the instructions and regulations on the subject, was 16,906*l.* 17*s.* 4*d.*

Somewhat less than 70 per cent. of the entire number of children vaccinated in England in 1877 were vaccinated at the public cost, while somewhat over 30 per cent. were vaccinated by private practitioners.

The National Vaccine Institution was called upon to meet 9,410 applications for vaccine lymph during the year, and it supplied 13,372 ivory points charged with lymph, 41 charged squares of glass each containing lymph equal to 4 charged ivory points, and 25,000 charged capillary tubes each containing lymph estimated to be equal to 10 charged ivory points. The subject of so-called "animal" vaccination was under consideration by the Board; but as, since the period to which the Report refers, the Board has announced its determination to make certain provisions for the supply of animal vaccine lymph from the National Vaccine Establishment, the observations of the Report on this subject need not occupy our attention.

The Report notes the inspections and inquiries which had been undertaken by its medical department, and briefly refers to its proceeding with regard to foreign epidemics. These subjects will be best considered when the Supplementary Appendix to the Report containing the Medical Officer's report makes its appearance. Noting, in passing, our gratification in learning that the "model bye-laws" of the Board are being steadily adopted in whole or in part by local authorities (the bye-laws with reference to new buildings were adopted and confirmed in no less than sixty-three instances during the year), we shall limit our further

consideration of this Report to the parts relating to reports of medical officers of health, the compulsory notification of infectious disease, and the spread of infection by schools.

With respect to the Annual Reports of Medical Officers of Health the Board observes.—

"In the reports of the many medical practitioners who, under one or other of the arrangements described in the table, hold the appointment of Medical Officer of Health, we find, as might be expected, very great diversities. There are some reports, not for large districts only, that give an able account of the sanitary history of the year, and show the Medical Officer of Health to have been active in investigating conditions relating to health within his district, and in advising his authority as to the nature of the measures requisite for sanitary purposes These reports present him as cognisant of the introduction or origin of communicable diseases, and busy in seeing to the use of all available means for preventing their spread, and they sum up the advice and the action of the year and help the sanitary authority to appreciate the value of their functions while indicating the directions for their future work. In other reports we find more or less of approximation to such a standard of work and of reporting; but there are still far too many reports which consist of a few numerical statements with some merely perfunctory paragraphs; which enumerate outbreaks of disease that experience has shown to be within the range of sanitary work, as if they were no concern of the writers, and which are in no sense profitable to the sanitary authority.

"On the whole, however, we are glad to recognise the fact that the reports year by year show that progress is being made by Medical Officers of Health in correctly appreciating the questions with which it is their function to deal; and that they contain on the one hand much information which enables us to advise local authorities as to the sanitary necessities of their respective districts, while on the other hand they record much useful work which those authorities have carried out."

In regard to the compulsory notification of infectious disease, it would appear that the Board has received petitions from certain local authorities and other public bodies in favour of a general compulsory enactment that all householders, or all medical practitioners, should notify to the sanitary authority the outbreak of infectious disease. The Board, however, do not think the time ripe for introducing any general measure on the subject.

The question of the dissemination of infectious disease through the medium of elementary schools has been pressed upon the attention of the Board. There is at present no legal power to enforce the closing of a school against the will of the managers, on account of a local epidemic; and although the readiness of most school managers to defer to the representation of the medical officer of health on this point is recognised, it is admitted

that schools have been kept open, notwithstanding his advice, where disease has appeared to be diffused from such schools. The Board intimates that it may be necessary to consider hereafter whether some amendment of the law may not be requisite to enable sanitary authorities to deal with this source of danger.

The Appendix to the Report contains, among numerous other papers, several reports illustrative of sanitary administration and progress in particular districts to which we shall probably refer hereafter.

REPORT OF THE FRENCH MEDICAL COMMISSION ON THE OUTBREAK OF PLAGUE IN THE GOVERNMENT OF ASTRAKHAN IN 1878–79.[1]

THE publication of the Report of the French Medical Commission on the results of its inquiry concerning the outbreak of plague in the Government of Astrakhan, 1878–79, will probably complete all the information we are likely to obtain for some time to come on that remarkable manifestation of the disease. Although the main features of the outbreak have already been made known by the Roumanian, German, and British Medical Commissions which were sent to the infected locality, and of which the reports have been for some time before the public, the present report shows that the subject is far from exhausted. Indeed, after reading this report it becomes more and more to be regretted that Russia should have hitherto withheld the official data on the subject.

One gentleman only constituted the French Commission, namely, Dr. Zuber, joint professor of epidemiology at the School of Val-de-Grace. He left Paris for the province of Astrakhan on the 22nd Feb. 1879, the outbreak of plague there, as it subsequently proved, having ceased a fortnight previously. Notwithstanding the personal courtesy extended by the Russian authorities to the foreign Medical Commissioners, it does not appear that they received such free help from the medical representatives of Russia as could have been desired. It must be remembered, however,

[1] *Une Mission Médicale en Russie. La Peste du Gouvernement d'Astrakhan en* 1878–1879. Par le Dr. C. Zuber, Médecin-Major, Professeur Agrégé d'Épidémiologie a l'École Val-de-Grace.

that the Russian medical men had responsible administrative duties to attend to which absorbed much of their time, and that as each of the Medical Commissions was independent of the others, it would have been no easy task to meet their several requirements On the other hand, a distinct advantage was gained from this independent action, and from the Commissions being largely thrown upon their own resources. The ground was beaten over, so to speak, by several different hands in different ways, with the result that each Commission has added something not collected by the others to the common stock of knowledge of the facts of the outbreak, and that where the different Commissions have arrived at like conclusions on the matters under consideration, these conclusions possess a certainty perhaps not otherwise obtainable.

According to Dr. Zuber (and here he is in accord with the Roumanian and German Commissioners) the outbreak began on the 17th (29th) October, 1878, and ended on the 27th January (8th February), 1879, after having carried off from 400 to 500 persons among a population (having regard to the infected villages alone) of from 11,000 to 12,000 souls.

The circumstances attending the beginning of the outbreak are thus related by Dr. Zuber:—At the end of October the *feldscher*,[1] Troubilof, living at Vetlianka (a village situated on the right bank of the Volga, nearly midway between the towns of Astrakhan and Tzaritzin, and having a population somewhat under 2,000) reported the existence in the village of a malady of an unknown nature, and asked for the assistance of a physician. A few days afterwards Dr. Koch, the superintending medical officer of the Cossacks of the district, visited the place, and examined the sick. In a report dated the 13th (26th) November he carried back the commencement of the disease to the beginning of the month, and stated that there had been thirteen cases, of which two had died. The chief of the Cossack forces, desiring to have more precise information than this report of Dr. Koch's afforded, thereupon sent Dr. Dœppner, principal medical officer, to Vetlianka. This gentleman arrived there on the 18th (30th) November, found eight patients recovering from

[1] The *feldscher*, according to Dr. Zuber, is a species of military sick-attendant peculiar to Russia—often a sort of bone-setter—ignorant, pretentious, obstinate, and constituting a veritable danger to the public health.

the malady, and returned to Astrakhan on the 20th November (2nd December). A week afterwards the *feldscher*, Troubilof, reported that the disease which had alarmed him, far from ceasing, was extending. Dr. Koch returned in haste to Vetlianka, and found not only that the malady was increasing, but that it had also become changed in character. Dr. Dœppner, on this information being received, was again despatched to Vetlianka, and arrived there on the 5th (17th) December. He found that since his first visit circumstances had changed most materially, becoming of the gravest, and he forthwith called for the establishment of temporary hospitals for *the isolation of the sick.* But as yet nothing had been said of the nature of the disease. Meanwhile the disease had appeared on the 11th (23rd) December in another neighbouring village on the right bank of the river, Prischib. Dr. Zwingmann, the medical inspector of the central government for the province, was immediately despatched to this place, and on his arrival there recognised that the disease was *plague.* It was then in all probability that the central government was first made aware of the existence of the disease in the province of Astrakhan. Dr. Zwingmann prepared a report in conjunction with Dr. Dœppner, which set forth their opinion on the pestilential nature of the outbreak and the necessity for quarantine, and on the 17th (29th) December he asked formally for the establishment of a cordon round Vetlianka. This was instituted on the night of the 19th —20th, December (31st December, 1878—1st January, 1879).

Nevertheless, some still doubted the nature of the disease, and for several days longer contradictory medical opinions were expressed on the subject, and served to confuse the public. That the disease was *plague* Dr. Zuber does not doubt, any more than the other foreign Medical Commissioners. Clinically it was observed as a grave fever, sometimes rapidly fatal without local manifestations, sometimes of longer duration with formation of crural, axillary, and sub-maxillary bubos. The disease presented different modifications at different periods of the outbreak. At the beginning of the outbreak it was characterised by feebleness of contagiousness, the almost invariable appearance of bubos, and a comparatively slight mortality, not exceeding, indeed, 30 per cent. At the height of the outbreak the contagiousness was overwhelming, bubos rare, and the mortality

enormous, namely, from 95 to 100 per cent. During the decline the contagiousness was variable, the mortality less, and bubos again became characteristic of the disease. The *contagiousness* of the disease was, according to Dr. Zuber (in this respect differing widely from some of the other foreign Commissioners) one of the most obvious phenomena connected with it. It was particularly manifested in determining a succession of *house-epidemics* (or we should prefer to say, in accordance with the data given by Dr. Petresco, *family epidemics*), these constituting the special feature of the outbreak. Dr. Zuber appears to us to have very imperfectly realised the actual significance of these house-epidemics in view of the conditions under which the contagion of plague is manifested, and he has given to the facts of contagion, as observed in this outbreak, a particular application very imperfectly supported by the circumstances of the outbreak. He applies them, indeed, to an explanation of the origin of the outbreak, which at the best, however, cannot claim more than a certain plausibility.

The facts that we have related concerning the beginning of the government inquiry give little promise that the origin would admit of close elucidation. And, indeed, the Commissioners generally admit that their inquiries have thrown little or no light on the matter, and that opinions on the subject must be formed on other than observed facts. Two principal theories are advanced to explain this origin, namely (*a*) an autochthonous development, and (*b*) an importation of the contagion from some place where the disease was previously prevalent. Dr. Zuber pooh-poohs the theory of autochthonous development as if scarcely worthy of serious argument. The theory of importation takes two forms. One, somewhat affected by Hirsch, seeks an explanation of the outbreak in the transmission of infected spoils from the seat of war (Asia Minor) to the banks of the Volga, by returning Cossacks. Another suggests—and this is the view adopted by Dr. Zuber—the introduction of the contagion from infected districts in Persia. Both theories proceed on the very intelligible ground that we do not know phenomena, such as were observed in the outbreak of plague in the Volga, in connection with a contagious disease such as plague, except as a result of the accidental introduction of contagion. Of the two forms of importation theory, Dr. Zuber's, to our opinion, has

certainly most in its favour, as being more in accordance with ordinary experience and the facts of the case. But both forms of the importation theory fail to account satisfactorily (or indeed to account at all) for the prevalence of larval plague in the city of Astrakhan the year previous to the appearance of plague on the Volga, and to the ushering in of the outbreak at Vethanka by larval forms of plague. If this larval form of plague is to be admitted (and Dr. Zuber himself admits it), and is to be regarded as part of the phenomena of the development of the disease in Astrakhan, the theory of importation, whether in the form that proves most acceptable to Dr. Hirsch or to Dr. Zuber, must inevitably fall to the ground

THE INTERNATIONAL MEDICAL CONGRESS, 1881.

THE office-bearers of the State Medicine Section of the International Medical Congress, 1881, have determined upon the subjects to be submitted to the Section for discussion, and the arrangement of these subjects during the several days of the Congress. We give below the names of the officers and the subjects for discussion. We may add that intending contributors of papers are requested to signify the subjects on which they propose to write to the Secretaries before the end of March, 1881.

STATE MEDICINE SECTION.

OFFICERS ELECT.

President :

JOHN SIMON, Esq., C.B., D.C.L., F.R.S.

Vice-Presidents :

Dr. GEORGE BUCHANAN. Surg.-Major Prof. DE CHAUMONT, F.R.S.

Dep.-Surg.-General NORMAN CHEVERS, M.D.

Dr. DOUGLAS MACLAGAN, F.R.S.E.

J. NETTEN RADCLIFFE, Esq.

Secretaries :

Prof. CORFIELD, M.D. Dr. THORNE THORNE.

SUBJECTS FOR PAPERS AND DISCUSSION.

First Day.

I. Measures by which to prevent the diffusion of different communicable diseases from country to country, or within the limits of any single country,—*e.g.* :

1. Yellow Fever, Cholera, Plague.
2. Enteric Fever, Scarlet Fever, Measles, Hooping Cough, Diphtheria.
3. Syphilis.
4. Glanders, Hydrophobia, Anthrax.

Second Day.

II. Influence of various articles of Food (not including Water) in spreading Parasitic, Zymotic, Tubercular, and other Diseases.

Third Day.

III. Conditions to be imposed on the legally-qualified practitioners of one country who may seek authority to practise in another country.

IV. Precautions to be taken in Medical Nomenclature and Classification to guard against False Statistical Conclusions.

THE PRACTITIONER.

DECEMBER, 1880.

Original Communications.

ON THE COMBINED USE OF MORPHIA AND CHLOROFORM IN PRODUCING AND MAINTAINING SURGICAL ANÆSTHESIA.

BY ALEXANDER CROMBIE, M.D. EDIN.

Superintendent of the Medical School and Mitford Hospital, Dacca, Bengal.

CLAUDE BERNARD'S remarkable observations on the effect of morphia in reproducing and prolonging the anæsthetic action of chloroform do not seem to have attracted the attention of English surgeons. Even on the Continent, notwithstanding their obvious great practical value, the experiments that were made, and which were entirely successful, as a corroboration of those which had been made on the lower animals, do not appear to have led to any general adoption of the combination in practical surgery. Shortly after the publication of Bernard's lectures before the College of France in 1869, M. Uterhart reported that he had employed the two drugs conjointly in five cases with excellent results;[1] and in 1872 MM. Labbé and Guyon communicated a note to the Académie des Sciences, in which they alluded to the observations of Nussbaum of Munich, and MM.

[1] *Practitioner*, vol. iii. p. 255.

Regault and Sarazin of Strasburg on the same subject, and detailed four operations in which the combination of the subcutaneous injection of morphia and the inhalation of chloroform was adopted.[1]

Beyond these two notices I have not been able to discover any allusion to the practice, and as I believe it to be one the importance of which cannot be overstated, and which, in my hands, has robbed chloroform almost entirely of its inconveniences and risks, I think it my duty to communicate my experience of it to the profession in a wider sphere than that which I have yet been able to influence in the course of my duties as an Indian surgeon.

The observations of Claude Bernard to which I allude first came to my notice in 1873, in the *Journal of Anatomy and Physiology* for November, 1869, page 166. They were to the effect that when a dog has been previously narcotised by morphia it can be quietly and completely anæsthetised by a much smaller quantity of chloroform than usual; that, under such circumstances, anæsthesia is induced without any initiatory stage of excitement; and that morphia reproduces the anæsthetic effect of a previous dose of chloroform.

At that time, 1873, I was resident surgeon at the Calcutta Medical College Hospital, where it was part of my duty to administer chloroform to every case requiring it, and I was abundantly familiar with the risks which accompany its use, and I determined to put Bernard's observations to practical proof on the operating-table. I was not then aware of the Continental reports on the beneficial effects of the combination, the references to which I have given above.

The first case that came up for operation was a strong young European sailor, a patient of the late Dr. Cutcliff. I administered twenty-five minims of the ordinary solution of the hydrochlorate of morphia by the mouth five minutes before he left the ward, and in two minutes more commenced the inhalation of chloroform.

Nothing could have been more disappointing than the result. The stage of excitement was violent and prolonged; the patient resisted, shouted, and struggled, requiring four or five assistants

[1] *Practitioner*, vol. ix. p. 58.

to keep him on the table. I had never had greater difficulty in getting a patient under chloroform, and the operation was finally performed while the excitement had been only partially overcome.

This result, so little in accordance with what I had been led to anticipate, I attributed, rightly or wrongly, to the morphia having acted as a cerebral stimulant instead of as a narcotic, which it is liable to do under circumstances of mental excitement, such as those under which this patient was labouring during the time when it was beginning to act upon him, that is to say when he was in a state of apprehension and agitation previous to the operation. I imagined that the usual excitement produced on the inhalation of chloroform had been intensified and prolonged in consequence of its coinciding with the stimulating action of a small dose of morphia. I therefore determined to adopt a different procedure in the next case.

I had not long to wait. An old native woman had been run over by a carriage in the street, and was brought into hospital with a compound fracture of both bones of the leg above the ankle. She was under the care of Dr. Cutcliff, who decided to amputate below the knee.

She was placed on the table, and immediately after the commencement of the inhalation of chloroform I injected twenty minims of the same solution of morphia (one-sixth of a grain) under the skin of the front of the abdomen. The stage of excitement was only faintly expressed, and on the cornea becoming insensitive to touch I removed the chloroformed towel from her face, and intimated to the surgeon that she was ready. There was some delay in securing one of the branches of the posterior tibial artery, which had been cut short, high in the apex of the wound, and the operation lasted exactly half an hour, from the time when she was "ready" till she was lifted on to a stretcher and carried off to the ward. During the whole of that time she lay in a calm, peaceful sleep, and I, as administrator of chloroform, had nothing to do but test the sensitiveness of the cornea from time to time. Twice only did she show signs of returning to consciousness, when the re-application of the towel to the face for a few seconds sufficed to restore complete anæsthesia.

The result in this case left nothing to be desired. The anæsthesia, once established under the co-operation of morphia and chloroform, was kept up for the space of half an hour by the inhalation, on two occasions only, of a few additional drops of chloroform, probably not amounting to half a drachm altogether. I have adopted the same procedure in every operation of any magnitude which I have performed during the past seven years, without any material variation, and invariably with a similar happy result.

When Dr. Cutcliff's lamentable death occurred in October, 1873, I succeeded him as lecturer on surgery, and as second surgeon to the Calcutta Medical College Hospital, and afterwards as Professor of Materia Medica, and more recently as Superintendent of the Vernacular Medical School and Mitford Hospital at Dacca, where nearly two hundred operations are performed under chloroform annually; I have continued to advocate, both by precept and example, the combined use of morphia and chloroform in the production and maintenance of surgical anæsthesia. Dr. S. B. Partridge, who was my colleague in the Calcutta Medical College Hospital, seeing my results, adopted and practised my procedure till he left India in January, 1879, and I believe that, till quite recently at least, it had also become a part of the routine practice of the other surgeons who have been connected with that hospital.

The advantages derived from the combination are first, the prolongation of the anæsthetic effect of the chloroform, once it has been established; and secondly, the small quantity of chloroform required to keep it up afterwards.

The first advantage is most conspicuous in operations about the mouth and face. The prolongation of the anæsthesia originally induced in this way is often so great as to enable me to perform operations of the first magnitude without being interrupted by the necessity of recommencing the inhalation of chloroform on account of the patient returning to consciousness in the middle of it. The benefit, both to the patient and surgeon, in these cases is too obvious to require mention. I will give two examples from my more recent experience.

In March, 1878, I removed the right superior maxilla from a native woman, aged forty-five, with the assistance of Surgeon

G. H. Peevor, of the 10th N. I. After the commencement of the inhalation of chloroform, twenty minims of the ordinary Liq. morph. hydrochlor. were, according to custom, injected into the cellular tissue of the upper part of the front of the abdomen. When she had become completely anæsthetised the chloroform was removed from her face, and I began the operation, which was performed in the usual way by a single incision The anæsthesia in this case was of such long continuance that it enabled me to proceed uninterruptedly to complete the division of the bony processes, remove the diseased bone, secure all the bleeding points, stuff the cavity and begin to stitch the skin over it, before the patient showed any sign of returning consciousness. At this stage I was obliged to desist for a few seconds for the first time during a long and difficult operation, until the anæsthesia was reproduced to enable me to complete the suturing of the superficial incision without pain. The contrast between the quiet uninterrupted progress of the operation in this case and what my experience of it had been when chloroform was used alone, when in consequence of the impossibility of applying the anæsthetic continuously, the patient used frequently to awake to semi-consciousness, and struggle and cry, with a ghastly wound in his face, was very striking.

In January, 1879, I removed a bony tumour from the lower jaw of a native boy, aged sixteen. The growth was in the position of the wisdom tooth, and involved the alveolus, and the anterior part of the ascending ramus I got at the base of the tumour by means of a curved incision, commencing above the angle and carried round on to the body of the bone and involving the facial artery. By dissecting up the flap so formed, I was able to remove the tumour, and leave the posterior margin of the ascending ramus, the angle and the body of the bone below the alveolus, intact; the instruments used being a small saw, bone-forceps, and a gouge. The operation was difficult and tedious, but it was only necessary to interrupt it once in order to restore the anæsthesia which had been primarily induced under the co-operation of morphia and chloroform in the usual way previous to making the preliminary incision.

The advantages of such long-continued insensibility are of course most obvious to the surgeon in operations on these parts,

because of the comparative immunity from interruption which he finds himself enjoying, and of which he is deprived when it is necessary, as in ordinary circumstances, to renew the administration of the chloroform at frequent intervals in order to keep up the anæsthesia. But the chief benefit lies in the fact that so very small a quantity of chloroform is required to reproduce anæsthesia, which has been originally induced under the co-operation of the combined drugs, as long as the influence of the narcotic alkaloid continues My experience is, that once complete surgical anæsthesia has been so established, from half a drachm to a drachm of chloroform is usually sufficient to keep it up for half or three-quarters of an hour, that is to say during the whole of the time required for all ordinary surgical operations. I have thus, I flatter myself, been able to eliminate from my practice most of the risks and complications of an overdose of chloroform.

Among the latter I include vomiting, which I rarely see now as the consequence of performing an operation under chloroform, when morphia has been injected under the skin. Vomiting in some cases occurs very early, and often before anæsthesia is complete, but in the later stages of an operation or after removal to the ward, it is very rare indeed. I therefore invariably use morphia in combination with chloroform in cataract operations; for although the long continuance of the anæsthesia is of no consequence in these cases, the risks of vomiting are more surely avoided

Last, but certainly not least, chloroform asphyxia has practically ceased to form part of my experience of the dangers of that anæsthetic. During the past three years, during which time at least six hundred patients have been brought fully under the influence of chloroform in my presence, I have only once had the opportunity of demonstrating to the students the action to be adopted on the occurrence of asphyxia under chloroform, and in that instance the usual precautions had been neglected.

Although it has never been my misfortune to witness a death from chloroform, I have frequently seen, before I began my present practice, the temporary abandonment of an operation necessitated by the arrest of the patient's breathing, and the

whole energy of the surgeon and his assistants directed to the restoration of that function, before the operation could be continued. It is true that during the first five or eight minutes after beginning the inhalation of chloroform, while the stage of excitement yet lasts, even after morphia has been injected under the skin, I not infrequently see the respiratory movements stop in a state of full inspiration. This I believe to be due to a sort of reflex spasmodic action of the muscles of inspiration, and it is easily removed by taking away the chloroform from the face, and then giving one or two smart slaps with the open hand over the epigastrium, or forcibly depressing the lower ribs. It sometimes constitutes a considerable obstacle to the administration of chloroform when it recurs, as it sometimes does, whenever the inhalation is recommenced. It usually disappears before anæsthesia becomes complete, and if watched for and immediately removed, is without risk.

Very different is the arrest of the function of respiration, in a state of expiration, which occurs during deep surgical anæsthesia from paralysis of the respiratory centre, from the continuous inhalation of large quantities of chloroform. This grave danger has not occurred in my practice, to the best of my recollection, since I have made use of the combination of morphia and chloroform I am now advocating, and when the precautions I insist upon have been faithfully carried out.

I attribute the immunity from this danger also to the small quantity of chloroform I require to give in order to keep up complete anæsthesia when it has once been induced under the influence of morphia,—and also to the great care I take that the free ingress and egress of air, to and from the lungs, are never for a moment interrupted. And this brings me to describe in detail the method by which I have obtained such good results.

It may have created surprise that I have continued to employ the ordinary solution of morphia for subcutaneous injection instead of a special solution for hypodermic use. The reason is that I have never been able to perceive the necessity for a special solution for this purpose. The common liquor morphiæ hydrochloratis has never in my hands produced the smallest pain or irritation, and it is always being freshly prepared, and is

therefore not liable to alterations from keeping, such as are likely to occur in a solution kept for a particular purpose, more especially in an Indian climate. Then an ordinary hypodermic syringe holds just the quantity of it, twenty minims, which I find to be usually sufficient. I ought here to state that my experience of late years has lain chiefly amongst natives, who are generally of small build and less weight, and with nervous systems less sensitive to pain, than Europeans. Were I practising in Europe I should probably find it necessary to employ a larger quantity of morphia than one-sixth of a grain to obtain the same result; say a fourth, or a third, which was the quantity used by MM. Labbé and Guyon.

I no longer use a towel or napkin for the administration of chloroform, but a metal cup with a perforated bottom, and with a piece cut out of the side for the reception of the nose.[1] The chloroform is sprinkled on a piece of sponge which occupies the bottom of the cup. The whole fits loosely over the nose, mouth, and chin; so loosely that it is impossible for the most careless administrator to prevent the freest admission of air to the nostrils at each inspiration. This is not the case with a folded napkin or towel, which can be tucked closely round the cheeks and under the chin.

I next insist not only on there being nothing tight round the neck and waist, but on the upper part of the abdomen and lower part of the chest being bared; and the person charged with the administration of the chloroform is directed to divide his attention solely between the state of the respiration, which he is thus enabled to watch in the clearest way, and the condition of the sensitiveness of the cornea. The rise and fall of the epigastrium and lower ribs are the best indication that air is entering and leaving the lungs freely.

As soon as possible, that is to say before there is complete anæsthesia, as soon, in fact, as the relaxation of the muscles will admit of it readily, I cause the condyle of the lower jaw to be pushed forwards out of the glenoid cavity on to the eminence in front. In other words, I insist on the teeth of the lower jaw being brought forward well in front of those of the upper, and retained in that position during the whole duration of the

[1] These cups are supplied by Government.

operation. This is easily done by pushing the bone forward by means of the thumbs placed behind the posterior margin of the ramus and angle of the jaw. This movement forward of the lower jaw has the effect of dragging forward the tongue by its root, and at the same time the hyoid bone, in consequence of the attachments to it of the mylo-hyoid, genio-hyoid, genio-hyo-glossus, and genio-hyoid muscles Since I adopted this expedient, which I learned from Dr. S. B Partridge, in 1873, I have entirely discarded the use of the barbarous tongue-forceps. The traction exerted by the displaced lower jaw on the hyoid bone and root of the tongue is much more efficient in preventing occlusion of the glottis, by the tongue falling backwards during deep anæsthesia, than can be effected by forcible traction by forceps applied to its tip. If this displacement of the lower jaw forwards is properly carried out, there will not be the least stertor or other sound of impeded passage of air to and from the windpipe, during the whole continuance of a long operation performed in a condition of the deepest insensibility. If that insensibility is of the prolonged character which is produced by the combined use of morphia and chloroform, no difficulty will be found in keeping the jaw in that position for any length of time, for the chloroform is only applied to the face at long intervals, during which the administrator has nothing to do but to keep the jaw forward and touch the cornea from time to time, the inhaler lying at one side. Should consciousness partially return, the jaw can be kept in position by one hand, while the cup is being reapplied for a few seconds to the face. If during the performance of an operation I hear the least noise in the breathing, I know that this traction on the root of the tongue is not being efficiently maintained, and a word of warning to the assistant charged with watching the anæsthesia suffices, by directing his attention to it, to restore that free and noiseless respiration upon which I insist throughout every operation.

By these means, by attention to these details, and by the combined subcutaneous use of morphia, asphyxia has practically ceased to form part of my experience of the risks of chloroform as an anæsthetic. This I attribute to the small aggregate quantity of chloroform required to keep up deep

insensibility during the whole time required for all ordinary surgical operations when morphia has been injected under the skin.[1]

Of the other great risk of chloroform, paralysis of the heart, I have, happily, had no experience either before or since I adopted my present practice; and I am aware that this terrible accident sometimes occurs during the first few minutes of the inhalation of chloroform before anæsthesia has been established. But the danger of this accident occurring during the stage of deep insensibility will, it stands to reason, be diminished in proportion to the smallness of the dose of the anæsthetic required to cause and reproduce the anæsthesia. The combination of the hypodermic use of morphia with the inhalation of chloroform would, I am confident, if universally practised, by acting in this way, materially lessen this grave danger One death from chloroform is said to occur in five thousand cases, so that the experience of any one practitioner is not sufficient to form an opinion of the value of any procedure calculated to avert its risks. But if I have eliminated, as I believe I have, from my practice one of the dangers of chloroform, paralysis of the function of respiration due to overdoses of the drug, it is reasonable to think that an expedient whose chief value lies in the smaller doses required to produce the desired effect will serve to diminish other risks arising from the same cause.

The advantages of chloroform over ether, in point of convenience, are so great, that only the admitted greater safety of the latter could have led to the present partial abandonment of chloroform as an anæsthetic in surgical practice. In India, where we ordinarily perform operations with a temperature of the air at, or little below, the boiling point of ether, we have had no choice. If, then, by means so simple as the con-

[1] That peculiar combination of consciousness with insensibility to pain, which Messrs. Labbé and Guyon described as having occurred in one of their cases, in which they had injected morphia previous to beginning the inhalation of chloroform, in which the patient was wide awake, and answered questions intelligently before sensibility returned, has never occurred in my practice. A few minutes after the injection of morphia, if the pupils are watched, they will be seen suddenly to contract, coincidently with the establishment of complete anæsthesia, and to remain in that condition as long as the influence of the narcotic continues.

temporaneous hypodermic injection of morphia, it be found that we can not only heighten the advantages of chloroform, but also at the same time raise it to the level of ether in point of safety, a great boon will have been conferred on surgery. This can only be done by a more extensive trial of the expedient suggested to us by Claude Bernard than it has yet received; and if such a trial should result in restoring chloroform to the confidence of surgeons, my imperfect advocacy of the combination will be forgiven.

ON RECURRENT PULSATION IN THE RADIAL ARTERY.[1]

BY AUGUSTUS WALLER, M B.

THE radial artery belongs *par excellence* to clinical medicine, being that vessel by which the physician gauges the circulation, and though few anatomical details are more familiar than those of its course and inosculations normal and abnormal, yet there is a clinical detail dependent on this, of which I have not been able to find any mention by authors who have treated of the pulse.

I refer to the pulse which continues distally in the radial vessel during its complete obliteration on the cardiac side. I speak of it as *recurrent,* since it is furnished *viâ* the radio-ulnar inosculating arterioles ; this may be proved by compressing the ulnar artery, while the radial artery is kept closed ; pulsation disappearing at once, and reappearing with increased force when pressure is removed from the ulnar

Apart from cases where the distribution is abnormal, the most favourable subjects for its demonstration are females, especially these who are recovering from some acute depression of health. But it may be noticed on a large proportion of ordinary patients ; on many persons of whom little more may be asserted than that they are below par, or of relaxed fibre, and occasionally on persons whose appearance and mode of life indicate no sort of deficiency.

Its great frequency invites statistics to its study ; it is necessary to have some notion of the numerical shares of anatomical variation and of morbid companionship, before attaching significance to instances. Up to the present time I have taken

[1] The MS. of this Paper was received in August last.—[Ed. PRACT.]

note of nearly 800 pulses on which these preliminary remarks are based.

It is not unimportant to describe the way which appears most suitable to the examination of this point. By the orthodox method of feeling the pulse, three fingers of one hand are placed on the artery, and its compressibility is estimated by judging of the degree of pressure which the fingers on the cardiac side must exert in order to remove the impulse felt by the fingers on the distal side. The imperfection of this method is, that our attention is prone to wander amid the impressions made on the adjacent fingers, a diminished impulse on a distal finger easily escaping notice in the presence of an undiminished impulse on an adjacent finger; especially if an effort of compression be simultaneously made. To clear up this doubt it is natural, if not necessary, to employ the fingers of each hand, and with the wrist of the patient held flute-fashion, to explore with one hand, while with the other the artery is compressed against the bone. The sense of muscular effort and concentrated attention to a slight impression do not interfere, and each sensation can be best appreciated. It need hardly be mentioned that attention must be focussed without remission on the impression of the exploring fingers to the exclusion of the stronger impression made on the occluding fingers. As an extra precaution, I have sometimes employed a padded finger-stall on one of the occluding fingers, to eliminate the impression; but it is easy enough without this to prevent the attention from falling in with the rhythm of the wrong impression. It is sometimes doubtful whether a pulse is recurrent or not, for it may happen that during the first few seconds compression entirely removes distal pulsation, which appears, however, after a more or less brief period, and gradually grows stronger. This is of interest, and shows that during examination an alteration of peripheral arterioles has taken place, namely, dilatation, but it is an element of uncertainty in taking statistics. It is faintly evidenced in most people (Londoners at least), and pulses should therefore be set down as non-recurrent when the distal pulse is not felt instantly after compression. I need hardly observe that it is well to hold the wrist so that the artery may with certainty be compressed against the bone, a matter of some difficulty on fleshy wrists. Simultaneous compression of the ulnar may be used in

confirmation of the recurrent nature of the pulsation. By this test, or by counting the pulse, any pulsation of the exploring fingers need never be mistaken for that of the subjacent artery.

On account of these various elements of uncertainty, I have refrained from building tables upon an insufficient number of observations, and confine myself to a few general remarks, that may elicit confirmation, or the reverse, from independent and unprejudiced observers.

Firstly, with regard to abnormal distribution. I find that of the whole number of pulses examined but a small proportion presented the phenomenon unequally on the two sides, viz. about 1 in 10. The probability of bilateral abnormality may be presumed to approach the probability of unilateral abnormality multiplied by itself; *e.g.* if it were 10 to 1 against an abnormal radial, it would be nearly 100 to 1 against both radials being abnormal; therefore the physiological cases in which the pulse is recurrent are numerous compared with the cases of anatomical accident.[1]

Secondly. Recurrent pulses are, at least, twice as frequent in women as in men; viz for London out-patients 60 per cent. for the former; 25 per cent. for the latter. Recurrent pulses are more frequent among hospital out-patients than among persons free of complaint; in town than among country folk; among the very old than among the very young.

Thirdly. On persons presenting no recurrence, the phenomenon may be markedly developed under examination by causing them to inhale nitrite of amyl. This is at the same time a demonstration of the action of the drug, and a proof that the pulse is borne through the arterioles. Muscular exertion and emotional excitement also conduce to recurrence

[1] The surgery of aneurisms and of wounds of arteries, affords numerous instances of recurrent pulsation, and of free hæmorrhage from the distal end of cut arteries. The pulsation that remains in an external aneurism during compression of the main artery, is the sign of the collateral circulation completed above and below the tumour. Exploration of the recurrent pulsation at accessible points of the vessel leading to and from the sac, may sometimes assist in estimating the prospect of collateral circulation after ligature at given points. The probability of a dangerous arrest of circulation or of an excessive collateral flow (either from functional or anatomical cause) might sometimes be indicated by the systematic exploration of distal pulsating points during compression of proximal points of the main artery.

especially marked during convalescence from fever, childbirth, or other acute conditions. I have not had many opportunities of watching the progress of a recurrent pulse in such cases, and can only state that I have known cases where it was present during convalescence, and notably diminished or quite absent during subsequent robust health.

Fourthly. Recurrence is a characteristic of the soft compressible pulse; its marked presence in a single instance is a probability of arterial relaxation; its chronic variation in a given patient denotes changes in his vascular tone.

It is generally the soft pulse that continues distally during pressure on the cardiac side of the point explored; the hard pulse, of which the distal manifestation is abolished by such pressure. If an error between compressible and incompressible is not occasionally to be committed, it is well to remember that when most compressible at the point of pressure, distal pulsation of the artery is most likely to persist if the heart's energy of propulsion be not reduced too low. It is necessary to admit this proviso, which gives a sufficient reason for the absence of recurrence usual in the soft and frequent pulse of acute adynamic states, and, on the other hand, for its occasional presence in perfect health with strongly-beating heart. The phenomenon may be supposed to pass through the following phases: viz. (1) with normal distribution and with normal relation between heart's energy and vascular tension—no recurrence; (2) at outset, and during height of fever, with full soft pulse and excited heart—recurrence; (3) during subsequent debilitation with small, frequent, soft, and, may be, dichrotic pulse and weakened heart—no recurrence; (4) during the progress of convalescence, with full soft pulse and easily provoked sweating—recurrence; (5) resumption of normal vascular relations—no recurrence. I have not traced all these phases in any one instance, but give the above as a generic image constructed from several instances.

To conclude: without attributing to the phenomenon an excessive importance, recurrence of the radial pulse may with advantage be borne in mind when we estimate pulse-compressibility. As a clinical index of arterial relaxation, it is possible that it may be found worthy of account.

ON INTESTINAL OBSTRUCTION.

BY JAMES FINLAYSON, M.D.

Physician and Lecturer on Clinical Medicine in the Western Infirmary, Glasgow.

THREE cases of intestinal obstruction admitted during three successive sessions into my wards in the Glasgow Western Infirmary excited so much interest in those who saw them, and raised so many questions of great importance in the diagnosis and treatment of such affections, that it seems desirable to place them on record in some detail.

The FIRST case was admitted to the hospital on the third day of his illness, with symptoms of acute strangulation of the bowel: abdominal section was performed on the following day, and the constricting band divided with the greatest ease, and with complete relief to the obstruction; but the patient died in the course of a few days from peritonitis.

The SECOND case had a more chronic course, but it presented likewise symptoms of great gravity and severity; the obstruction gave way at the time when the anxiety for his life had reached a climax. During his stay in the hospital, however, other two attacks of equal gravity supervened; but after the third relief the recovery was complete and permanent; he was dismissed in twelve weeks quite well, and is reported to have continued in good health when seen four months later.

The THIRD case presented a certain resemblance to the second in its history of a somewhat chronic illness, but the suffering was even more terrible to witness: enormous doses of morphia were required to keep the pain in check—as much as eighteen or nineteen grains being injected under the skin in the course of twenty-four hours. As in the second case, the obstruction gave way and recurred more than once, and we hoped, for a time, for

an equally favourable issue; but ultimately the symptoms pointed to malignant disease as the cause of the intractable disease, and after a residence of nine weeks, and a period of intercurrent diarrhœa, the case ended in death, and the inspection revealed the presence of epithelioma at the ileo-cæcal valve.

The various points of interest can only be seen on giving a somewhat detailed account of the progress of the cases; these will be readily understood by all who have had any considerable experience in dealing with this formidable affection.

CASE I.—John F., æt. 25, was a worker in a ship-yard. There was nothing of any consequence to be ascertained regarding his previous history, except that he had long been subject to chronic bronchitis.

He seems to have been drunk on Saturday, Oct. 28th, and could not give much account of himself for that night; on Sunday, the 29th, he had colic, for which he received castor-oil and laudanum twice, but apparently without any relief to the bowels. Vomiting was said to have occurred on Sunday and Monday along with the abdominal pain, and as he was not improving he was admitted to the Western Infirmary on the third day of his illness, viz. Tuesday, the 31st of October, 1876. On admission he was found to be suffering from pain in the belly, frequent hiccup, and vomiting: the vomited matter had a distinctly fæcal odour. The pain was below the umbilicus, and was distinctly increased on pressure; it was not confined to one side of the middle line. The resident assistant gave him one-third of a grain of morphia hypodermically, and a small injection with oil was administered by the bowel.

In the evening he was seen by me, along with my surgical colleague, Dr. Patterson. The acuteness of the pain and the vomiting had both been controlled by the morphia, but the hiccup still continued. There was only very moderate distension of the abdomen. The percussion-note over the whole of the front of the lower region of the belly was dull, and this dulness extended to nearly two inches above the umbilicus, where the usual resonance was obtained; the note in the flanks was also natural: this area of dulness was not affected by change of position, and, although quite distinctly dull, there was an obscurely tympanitic quality associated with the dulness.

Although a catheter had been passed by the resident assistant, Dr. Patterson again introduced an instrument; but the bladder was found nearly empty, only a drachm or two of urine being brought away, and of course no change occurred in the extent of the dulness. This dulness, I felt sure from previous experience of a similar case, resulted from the extreme distension of the bowel. A large injection was then given, but the fluid came away without almost any odour or tinge of fæces; an attempt to press up a tube was not successful, as it could only be introduced an inch or two. Nothing special was found on examining by the rectum, and no indication of an external hernia existed. The temperature was nearly normal. Pulse 112.

It seemed to us, on a review of the case, that we had here the signs of an internal strangulation affecting the small intestine, and the question of opening the abdomen was discussed, but in view of the quiescence of the symptoms under the morphia we thought the question might be adjourned till next morning.

During the night of the 31st October the patient was easier: nothing but a little ice was given. He vomited a very little about 2 a.m., but slept pretty well till the morning. At 7.30 a.m. he vomited a large quantity of matter with stercoraceous odour.

A consultation of the medical and surgical staff was called at 9 a.m. on Wednesday, November 1st. The condition remained essentially the same: hiccup continued, and the expression of the face was somewhat anxious; but there was no elevation of temperature. Pulse 104. The percussion dulness remained unchanged; a few ounces of urine had been passed naturally; the tongue was moist and pretty clean, and the patient complained of hunger, and seemed anxious for food. Some difference of opinion existed as to the diagnosis and the treatment, but the tendency of opinion was to regard the case as beyond the reach of medicine; and as the prognosis seemed almost absolutely hopeless if the patient were left alone, it was decided to offer him the choice of a dangerous surgical operation. He accepted the offer, after due explanation as to its danger and risk.

Immediately thereafter he was put under chloroform and Dr. Patterson opened the abdomen, the carbolic spray and other antiseptic precautions being used. The small intestine was

found greatly distended and of a port-wine colour; no lymph or effusion was detected. On following the distended bowel downwards a cord-like band was found in the vicinity of the cæcum; this was easily torn by the hand, and the relief was at once apparent.

On the following day, November 2nd, it was noticed that the patient had vomited only once on the previous evening. The bowels had been freely open, large motions having come away, and no distension existed. The patient, however, was restless, and his breathing seemed affected, apparently from bronchial irritation.

During the next day considerable improvement was noted, and no signs of peritonitis were detected then, but during the night delirium occurred, and the temperature rose; these unfavourable signs continued during the whole of the 5th of November, the prostration increased, breathing became worse, lividity was marked, and he died early on the morning of the 6th of November. Although the termination was unfortunate, the result showed the correctness of the diagnosis and treatment. The case seemed one of the very kind most suitable for operation, and there was certainly not much time lost in deciding on this serious procedure.

The *post-mortem* examination was made by Dr. Coats on November 7th; permission was only obtained to examine the abdomen. The wound was found to extend from an inch above the umbilicus to two inches above the symphysis pubis. The greater portion of the wound was gaping, and a dark-coloured loop of intestine was protruding in it. The intestine was found adherent round the wound, but was easily separated. Towards the pelvis there existed numerous firm adhesions of the omentum to the anterior wall of the abdomen, and of coils of the small intestine to each other. One special band proceeding from the great omentum in the right lumbar region was found unattached, and appeared to have been torn; it was about five inches long, and had considerable tenacity. A portion of intestine thirteen inches long, and situated at the ileo-cæcal valve, was found intensely hyperæmic, and this hyperæmia extended through the entire coats, and was distinctly demarcated both above and below. Another portion about a foot above this was also affected

in the same way, but not to such an extent; the mucous membrane here, however, presented one or two sloughs; one of these sloughs appears to occupy the entire thickness of the intestine, and the peritoneal coat is found adherent to the abdominal wall in this region.

Case II.—Robert Shearer, a carter, æt. 32, was admitted to the Western Infirmary on November 17th, 1877, suffering from excruciating paroxysms of abdominal pain. There had been absolutely no motion from the bowels for five days; but the discharge which had occurred then, after an enema, was very slight, and the duration of the obstruction might really be stated as fourteen days at the time of his admission. It seemed, moreover, that for a year he had frequently been troubled with attacks of constipation, accompanied by sickness and abdominal pain; these usually lasted only two or three days, and yielded to some simple treatment. Six weeks before admission he had been affected in this way, the attack being perhaps brought on by exposure to the weather from sleeping in an outhouse, but this had passed off. More than a fortnight before admission the patient began to have a frequent desire to go to stool, without being able to pass much from the bowels, and, as already stated, the obstruction had been almost complete for fourteen days. The pains complained of were evidently of a colicky or griping character, and were at first of only occasional occurrence; but as time went on they became both more violent and more incessant, and during the night before admission they were so severe that the neighbours heard him screaming out in his agony; when seen in the receiving-room of the hospital he was writhing and groaning on the bench.

The history of the patient pointed to some wasting disease in childhood, termed a "decline;" but no definite evidence of phthisical disease could be traced in the family history, neither could any signs of this be made out on examining the chest

After admission he was put to bed, fomentations applied to the abdomen, and grain-doses of opium were given every hour in the first instance. A large enema, consisting of water with some soap and castor-oil, was administered after a little time, and this brought away a small quantity of fæces in little pieces of a bright yellow colour; some wind, likewise, was passed at the

same time. In a few hours the patient felt a little easier, probably from the effect of the opium; a further injection was tried, and special attention was directed to see how much fluid could be introduced; 90 ounces were administered in this way, and the water came back without any odour or colour of fæces.

The patient had vomited frequently since the beginning of the attack, but the vomited matters consisted simply of the food rejected, and had never been in the least fæcal. The distension of the abdomen was by no means great, but the walls were tense; no tumour could be felt, and there was no sign of an external hernia. The urine was perhaps a little scanty, somewhat high coloured, and free from albumen.

On the following day (Nov. 18) the patient was reported as rather better; he had passed a pretty good night, the opium had been continued in less frequent doses; there was slight hiccup, but no vomiting had occurred, and the distension of the abdomen had not increased; the percussion throughout was tympanitic, and the colon did not seem to be the seat of the distension; the bowels could be felt moving under the hand in the umbilical region, and slight gurgling was also perceptible.

It seemed clear that the obstruction in this case was not complete; not only had wind been passed from the bowels on various occasions, but the small fæcal motions washed out by the injections indicated that some of the contents were able, at times at least, to pass down the bowel. The cessation of vomiting and the greater ease of the patient seemed to point to the beginning of an improvement. Dr. Peter Stewart, who happened to see the patient with me on the day after admission, agreed with me in thinking that we might now venture on a purgative dose of calomel. Accordingly twelve grains of calomel were given at 11 a.m. This was retained, but did not produce any motion, and at 5 p.m. a large quantity of fluid was injected by means of a long tube; the tube was passed up eighteen inches, not indeed at first, but after the lower bowel had been somewhat distended with fluid; it was then found that it could be introduced to the distance named. Some 70 or 80 ounces of fluid were injected slowly, but after this it began to return. A few fragments of fæcal matter came away with the water, and both at this time and also later in the evening some wind was passed from the

bowel. The pain, however, began to return, and opium pills were again ordered.

On the third day after admission (Nov. 19) he was reported as having suffered much from colicky pains, although he had slept some: he had also vomited a little dark fluid once during the night, but this had no offensive odour. There was still reason to believe that the small intestine was the seat of the obstruction, and particular coils could be felt swelling up here and there. The abdomen was still distended, but free from pain on handling it; the temperature was only very slightly, if at all, elevated; the pulse continued at the rate of 100. The tongue was extremely foul.

A consultation of the physicians and surgeons was called, specially to discuss the question of operatic interference. Various opinions, of course, were expressed; but the majority agreed with me in thinking that the case had not yet passed beyond the realm of the physician. It was agreed to try belladonna, and the patient was ordered pills containing the extract and powdered leaf of belladonna, of each gr. $\frac{1}{8}$ every three hours; to have only a little milk and the white of eggs by the mouth, and at night repeated injections of beef-juice by the rectum: a large enema also was tried in the afternoon. This last was administered by the long tube: on introducing it the end was at first caught about the level of the sacrum, but on distending the lower bowel the tube was ultimately introduced about twelve inches; the fluid was pumped in very slowly, and fully 100 oz. were introduced before the liquid began to come back: the patient was directed to retain it as long as possible, and when it came away a slight discharge of fæces accompanied it, something like the last small motion obtained.

Next day (Nov. 20) the patient seemed somewhat easier: he was free from vomiting and hiccup: he had passed a little wind from the bowels, and the beef-juice injections had been well retained. The belladonna pills were continued every four or six hours; the pupils were pretty fully dilated, and the throat felt dry. An injection given without the long tube in the evening failed to bring away any fæcal matter Later in the evening some green bilious matter was vomited, but it

had no fæcal odour: during the night further vomiting occurred of the same character, and the hiccup had returned. The pain had also become more severe, although the action of the belladonna was evidently well established; and he was ordered a grain of opium two or three times during the night.

On the following day (Nov. 21) he reported that he had slept a little, but the colicky pains and distension were still present; the pulse was a little more rapid (118), and the tongue continued extremely foul. A large enema, administered by means of the long tube, failed to bring away any fæces. The belladonna was ordered to be continued regularly, and the opium given if the pain returned severely.

On November 22nd, being the 19th day after the serious symptoms of obstruction had shown themselves, a new feature was declared: the patient had vomited, about midnight, a quantity of offensive fluid which was said to have a fæcal smell at the time, although in the morning this could not be confidently alleged. The belladonna had been continued, and some opium also, as the pain had been severe; but the patient could not be pronounced worse. As, however, this fæcal vomiting was a new and important symptom, I thought it proper to summon such of my surgical colleagues as were in the hospital at the time; because one of the reasons for delaying any operative measures was the absence of persistent and especially of fæcal vomiting. After the patient had been seen by one of the surgeons, and while waiting for the arrival of another from his wards, the patient passed a copious motion, amounting to about half a chamber-pot full of light-coloured pultaceous matter. Immediately after this the abdomen felt less tense, but was not much reduced in size; the patient, however, felt relieved. During the course of the same night two or three additional motions were passed, and in the next two days several more motions occurred. The medicines were of course stopped, and a little more food cautiously allowed. The abdomen became soft and natural; no tumour or hardness could be felt; the tongue began to clean, and the patient rapidly assumed a pretty satisfactory appearance.

But this satisfactory termination of a grave attack was not by any means the end of his illness. The relief of the

obstruction occurred on Nov. 22nd, and between that time and Dec. 8th the bowels acted very freely; indeed, the patient suffered from several recurring periods of diarrhœa, so that he had to be placed again on milk diet, and even bismuth and opium were prescribed to check the looseness. Thereafter, although care was taken not to prolong this treatment, the diarrhœa gave place to constipation, and this was not relieved by castor-oil; pains likewise set in, and we found ourselves in presence of the old symptoms. This second attack may be dated as lasting from Dec. 10th to Dec. 28th.

It is unnecessary to detail the exact course of this illness, as the similarity of the symptoms and the treatment to the former attack was very close. As before, the obstruction was not complete; some wind was frequently passed, and the injections sometimes brought away small quantities of fæces, which had evidently passed the obstruction, but these scanty evacuations scarcely produced any relief. The vomiting was not troublesome in the early part of this attack, probably because from the first the food given by the mouth was reduced to small quantities of milk with white of eggs, and injections of beef-juice were begun early. The quantity of urine passed was usually pretty abundant, considering the small quantity of food given; sometimes, indeed, it was very large, 35 to 55 oz. being noted a week after the symptoms of obstruction began, and on one occasion even 80 oz. This excited considerable surprise, as the amount of milk and white of eggs given by the mouth seldom exceeded 15 oz, and often fell short of this, and when sickness was threatened small pieces of ice only were given. The explanation of the large quantity of urine passed was considered to depend on the enemata; not so much those of a nutrient character as the large tepid-water injections which were used again and again: sometimes it was noticed that the amount returned was distinctly less than that introduced. The sp. gr. of the urine varied with the quantity passed: thus on Dec. 17 the quantity being 36 oz., the sp. gr. was 1032; on Dec. 19, the quantity being 56 oz., the sp. gr. was 1014; and on Dec. 21, the quantity being 80 oz., the sp. gr. was 1010. Another explanation of the free secretion of urine in this part of the case was no doubt

the absence of vomiting; and somewhat later in this attack, when vomiting began to occur, the urine diminished in quantity and the sp gr. rose: throughout the case albumen was invariably absent.

The administration of belladonna in this attack was pushed more freely, about as much as ½ grain of the extract being given every three or four hours sometimes, but the intervals were often a little longer: at times the effect on the throat was pronounced, and the medicine was stopped or diminished; and during the alarming attack on Dec. 22nd (to be noticed presently) the belladonna was stopped, in case it might be responsible for any part of the disturbance. On Dec. 21st, and for two or three days previously, a curious urinary symptom was observed, viz., a hesitation, as it were, in the contraction of the bladder, and the stream of urine sometimes stopped; along with this difficulty there was a little pain in micturition: the quantity of urine at this time was abundant. There was some suspicion that this symptom might be due to the belladonna. This free use of belladonna seemed, however, to fail in relieving the pain of the spasms in the bowels, and morphia suppositories, or other preparations of opium, were had recourse to when the pain was severe. Sometimes the opiate was administered in the form of twenty-minim doses of Battley's solution, given with the beef-juice injections, to favour their retention as well as to subdue the pain: the aim was to give belladonna steadily, and only as much opium or morphia as seemed absolutely necessary to overcome the violent pain.

The tension of the belly varied a little from time to time, but always remained considerable; the swelling, however, was by no means excessive, and seemed to be much the same as during the former attack. The swollen coils of bowel felt during a paroxysm of pain seemed to indicate that the mischief was situated in the right iliac region.

On December 22nd a serious change for the worse occurred. An injection given the previous night had failed to bring away anything more than one or two small pieces of fæcal matter; during the night violent spasmodic pains came on; the patient vomited, and early in the morning vomiting of green bilious-looking matter supervened. At the visit-hour in the forenoon

he was found to be looking desperately ill, pulse over 100, but scarcely perceptible, surface cold and appearance collapsed. He was ordered at once a morphia suppository; the belladonna was stopped, a fomentation applied to the abdomen, and only a little ice allowed by the mouth, but nutrient enemata as before. Under this treatment he rallied, and by the next day had regained his usual appearance. The belladonna was resumed on the 24th December, and enemata tried again and again with but little result; indeed, the vomiting became more troublesome; the vomited matters were usually bilious in appearance, never fæcal, but sometimes seemed to consist of altered blood. This unsatisfactory state continued till December 28th, on which day he seemed worse than ever (except during the time of collapse already mentioned); but on that night some improvement set in —probably the obstruction had been then overcome, as early next morning he passed a small motion and the tension of the abdomen had disappeared: two or three motions occurred during the course of the next twenty-four hours, and this second attack of obstruction, after lasting from Dec. 9th to Dec. 28th, was obviously at an end.

Warned by the experience of the relapse, great care was taken to prevent, if possible, a third attack; the diet was carefully regulated, and the patient was kept in bed long after he might otherwise have been allowed to get up; attention was also directed to the least symptom of abdominal pain, and the patient seemed in a fair way to recover; but on January 8th the bowels ceased to act, and a third attack, lasting from Jan. 8th to Jan. 19th, was endured. The symptoms and the treatment were essentially the same as before: on January 17th a paroxysm of pain of greater severity than any previously witnessed supervened; the patient sat up in bed and felt as if he would choke, the pulse became uncountable, the aspect pinched, and the perspiration appeared in great abundance. Under free use of opium or morphia the pain subsided again. The resolution of this attack differed from the previous ones in concurring with the use of an injection. A large quantity of tepid water was introduced by means of the long tube, the patient lying on his right side, and when it acted immediately afterwards a little fæcal matter came away; but when it acted a second time, for all

the water did not seem to have come away at once, a very distinct fæcal motion was obtained, with great relief. Several motions subsequently occurred, and the recovery was complete and lasting. He was dismissed in the course of two or three weeks, and he was searched out and found to be all right four or five months later.

CASE III.—William Wilson, æt. 22, a sailor by occupation, and a native of Hamburg, was admitted to the Western Infirmary on the afternoon of October 7th, suffering from severe pain in the abdomen and with a history of constipation. The bowels had acted slightly on Oct. 1st, but they had not been properly relieved for at least a fortnight before that time. He had been taking various forms of purgatives during that interval, most of which he had vomited. The paroxysmal pains from which he suffered began on Sept. 29th. There had been no severe vomiting, except in connection with the taking of physic: he had, however, been taking very little food for the last four days, as his stomach could not retain it. For three nights he had slept little, on account of the severity of the pain. About four days before admission he seems to have become much worse, as up to that time he had been able to walk about to some extent.

When seen by me on the night of Oct. 7th, he was suffering from severe paroxysmal pains, occurring every ten minutes or oftener; during these paroxysms tense portions of intestine could be felt in the lower part of the abdomen, particularly on the right side. There was no very great distension of the abdomen: the percussion-note was tympanitic: there was slight tenderness on pressure and some sensation of gurgling in the right iliac region above Poupart's ligament. No hernia could be detected, and on examination *per rectum* nothing was felt except general bulging from the distended bowels. The case had a very protracted course, with several periods of partial improvement leading to hopes of a complete recovery; but after more than two months' residence, and many periods of excruciating agony, the patient at length succumbed, in the midst of the most extreme weekness and emaciation, during an attack of looseness of the bowels when all abdominal pain and distension had quite subsided.

The source of the mischief proved to be an epithelioma involving the *caput cæcum coli*, and extending to the ileo-cæcal

valve: the growth presented very marked softening in certain parts, due to colloid degeneration, and the completeness of the obstruction might no doubt be lessened by the breaking down of certain parts of the tumour As a lesion of this kind in this situation is somewhat rare, the following notes, extracted from the report by Dr. Joseph Coats, are added :—" In the right lumbar region a tumour is observed connected with the ascending colon, and in fact forming a part of its wall. At the seat of the tumour the colon is puckered, and the serous membrane has a dead-white, half-cicatricial appearance. There is comparatively slight adhesion to surrounding parts. By cutting up the intestine the tumour is found to have its seat in the *caput cœcum,* just within the valve, which it partly involves. It is circular in shape, measuring about an inch and a quarter in diameter, and with markedly prominent margins which partially overhang. Its surface towards the cavity of the bowel is somewhat rough, and in the central parts it is somewhat deeply ulcerated. It is to be observed that the *caput cœcum* is almost entirely involved in the tumour, which has formed a ring around it, the ring-shaped tumour gradually contracting till the calibre of the *caput* is nearly obliterated. A probe can still be passed through the centre of the tumour into a small pouch from which the normal vermiform appendage passes off. The ring-shaped tumour is just at a level with the valve, partially involving it, but not *at present* producing any great obstruction to the passage from the ileum into the colon, the constriction described above being virtually beneath the valve, and only shutting off the remains of the *caput cœcum* and the vermiform appendage. The mucous membrane of the lower part of the ileum is very much thickened and deeply pigmented, and the calibre of the gut is greatly increased. Above, there is little if any thickening, but a frequent pigmentation of Peyer's patches. In the ascending colon there is great thickening and pigmentation of the mucous membrane. This is less marked in the transverse colon, but is again very pronounced in the lower part of the descending colon and rectum. . . On microscopic examination of the tumour there are found glandular-looking masses of cells, with a remarkable tendency to colloid degeneration. In some places there are vacuolated cells filling the spaces, and in others the regular

appearance of colloid cancer. It can be seen that the cancer extends between the muscular trabeculæ, these extensions being often colloid, in which case the infiltration presents very prominent appearances. The lymphatic glands of the mesentery are very slightly enlarged, and are not the seat of any secondary tumours."

In view of the pathological details given above, the course of the case became intelligible enough; but during its progress the nature of the obstruction was very obscure, and indeed it was only a few days before death, when the abdomen had collapsed, that a tumour could be felt in the region of the cæcum; the repeated relapses and the extreme degree of emaciation had led before that time to a suspicion of some malignant growth.

The obstruction was not quite complete, at least for very long periods; but from October 1st till October 18th no motion was passed, and the enema given failed to bring away even small quantities of fæces; on the 18th and 19th, however, some fæcal discharge occurred, on the second occasion the motion coming away with the injection fluid which had been retained from the previous day. On the 18th the tension of the belly was less, and the hope was entertained of relief having occurred; but on the following day, although a further discharge took place, the tension had returned and the symptoms continued.

The next time of apparent improvement was on October 27th. From the 18th to the 27th repeated discharges of fæcal matter came away in small quantity, usually after enemata had been used, and these motions, obtained in this way, seemed to afford a slight amount of temporary relief; but this was both very slight and very temporary, for the paroxysmal pains in this period attained an extreme intensity, notwithstanding the enormous doses of morphia administered. Sometimes the large injections given in this period returned without the colour or the odour of fæces. The explanation no doubt was that small quantities of fæces succeeded at times in passing the stricture, and remaining for a short time in the large bowel they had time to assume the form of small fæcal masses, and these were expelled with the large enemata; but after their removal the descending colon remained empty for a time, so that succeeding injections were scarcely ever coloured. On the 27th October

a very distinct discharge occurred, and the tension of the belly became less than it had been since the 18th. This improvement was short lived, and the paroxysmal pains scarcely abated in their severity.

Between October 27th and October 31st several small motions came away without, however, producing the relief desired; but on the last-named day, after an injection, a large and satisfactory motion was obtained, much larger than anything passed since admission, and it was noted that the fæcal masses were of considerable size. It seemed at last that the mischief had been overcome, as the belly had fallen and the pains had ceased. Next day (November 1st) the obstruction and the pain seemed to be quite gone, and the only untoward circumstance was the collapsed appearance of the patient, which was ascribed in large part to the sudden reduction of his morphia, to which more particular reference will be made shortly.

Next day (November 2) another large motion came away with an injection, and the patient began to take food more freely; but in the course of another day spasmodic pains again set in, and the tension of the belly returned to some extent. From November 3rd to December 1st the patient passed through many phases of abdominal tension and pain for short periods, with intervals in which the bowels acted naturally, without enemata, and large well-formed motions came away. After such motions the abdomen sometimes lost its tenseness, and became almost natural. After every such remission we hoped that the end had at last come, and during some of these the patient took food pretty well. Although considerable care was exercised as to his diet: it seemed essential to take such opportunities of feeding him, as the prolonged illness had reduced an originally strong, robust young man to a state of extreme debility and emaciation.

On December 1st the final relief to the symptoms of obstruction occurred. During the previous day the pain had been exceptionally severe, even although very large doses of morphia were given hypodermically; the distension was also greater, and slight vomiting occurred in the evening. Early in the morning, however, the patient experienced relief without any motion having occurred, although perhaps he may have passed some

wind, and at 5 A.M. he felt so well that he took some food. At 8 A.M. he was found well and free from pain, the distension quite gone, and within an hour he had two very large clayey motions (say about 80 oz), after which the abdomen became completely collapsed. On December 3rd a small dose of castor-oil was given, and on the following day he passed a well-formed motion, and also a second one somewhat looser. Even now some hope was entertained of a recovery, as no tumour had yet been felt; but after a fluctuating period in which the bowels seemed about to regain a natural action, and with only one day characterised by much pain, a persistent and intractable diarrhœa set in, the emaciated and haggard appearance of the patient became extreme, and death occurred on December 11th.

Vomiting was not a prominent feature in this case. Before admission, indeed, there had been a good deal of sickness, but this was due apparently in great part to the use of purgative medicines After admission not only were these stopped, but the amount of food by the mouth was reduced to very small dimensions; and on some days, when sickness was specially threatened, almost nothing but a little ice was allowed. On the fourth day after admission the vomited matters were offensive and almost fæcal in odour; when this occurred the stomach was kept empty for a time, after which small quantities of food were retained. To supplement his very spare diet nutrient enemata were begun at the same date, and continued more or less throughout, although they were omitted when the patient seemed about to recover and could take food; to these enemata pancreatic wine was added. The vomiting frequently returned, especially during some of the worst paroxysms, but it never again suggested the idea of fæcal odour, nor was it ever profuse or incessant.

The quantity of urine passed in this case was considerable; and in view of the fact that very little food was given, and also that very large doses of morphia were administered (which is usually supposed to lessen the secretion), the amounts noted are very striking. The free secretion was no doubt connected with the fact stated in the preceding paragraph, viz., that there was no very excessive vomiting; but as in Case II., or even more distinctly than in it, the explanation may be sought in the

absorption into the system of part of the fluid administered by injection into the bowel. These enemata were administered very frequently, often daily; they were as a rule very large, and often amounted to sixty fluid ounces or more; they were frequently administered by means of the long tube, and were introduced slowly, so as to penetrate to a high level and to be retained for a time; not unfrequently they were retained for hours, or it might be for a whole night or day; even when returned soon after their introduction it was often seen that part only of the fluid came away at that time. So far as could be judged, they were beneficial to the patient, not merely in bringing away fæcal matter or intestinal gas, but also, apparently, in improving his general condition and lessening his shrunken aspect. The quantities of urine were noted pretty carefully throughout his residence; during the first two days the quantities were apparently small, and during the last few days, when a persistent diarrhœa had become established, they were likewise low; but during all the rest of the period, including the time of serious obstruction, as well as the intervals of apparent recovery when fuller diet was allowed, the figures seldom fell below 28 oz., and often reached 40, 50, 60, 80, and even 90 oz. With such frequent use of large enemata it was difficult to estimate their effect on the urine from day to day; but some interest was attached to the observation of the variation in the quantity of urine on those days on which the enemata were wholly or partially retained for periods of hours. Watching thus we satisfied ourselves that a decided increase in the urine could be frequently traced in this way, and the following notes and measurements may suffice to convince the reader likewise.

No injection was given on the 13th of October, and the urine for twenty-four hours, collected up to the morning of the 14th, was 35 oz.; an injection by the long tube was given on the 14th, and the urine as measured for twenty-four hours till next morning was noted as 55 oz. Again, in the forenoon of October 24th, 60 oz. of fluid were introduced into the bowel; this was retained till the evening, when another was administered, and this acted in half an hour, bringing away a small quantity of fæcal matter mixed with the fluid; the urine rose from 19 oz. on

THE CORPORATION OF THE

Scottish Provident Institution.

No. 6 ST. ANDREW SQUARE, EDINBURGH.

THIS OFFICE alone combines the advantages of **Mutual Assurance** with **Moderate Premiums.**

THE PREMIUMS are so moderate that at most ages an [illegible]surance of £1200 or £1250 may be secured from the first for the same yearly payment which would elsewhere assure (with profits) £1000 only.

A person of 30 *may secure at once* a provision of £5000 for his family, in case of his death, by a payment of little more than £100 a year.

The whole PROFITS go to the Policyholders, on a system at once safe and equitable,—no share being given to those by whose early death there is a *loss*.

The effect of reserving the surplus for the survivors (who will, however, comprise more than half the members) has been that policies for £1000 have already been increased to £1400, £1600, and upwards. Some of [illegible] already been doubled.

In each of the last Six Years the [illegible] exceeded **a Million.** The **Income** in 1879 was [illegible]

The Accumulated FUNDS at the close of the year were £3,629,[illegible]

Since the Act of 1870 the Funds have increased by Two Millions Sterling.

THE 5TH INVESTIGATION with DIVISION of SURPLUS will be made at the end of the present year.

REPORT, *containing* STATEMENT OF PRINCIPLES, *will be sent on* [illegible]

EDINBURGH, *Oct.* 1880. JAMES WATSON, [illegible]

LONDON OFFICE—17 KING WILLIAM STREET [illegible]

Scottish Provident Institution.

[illegible]BLE OF PREMIUMS, BY DIFFERENT MODES OF PAYMENT,

For Assurance of £100 at Death—With Profits.

Age next Birth-day.	Annual Premium payable during Life	ANNUAL PREMIUM LIMITED TO			Single Payment.	Age next Birth-day.
		Twenty-one Payments.	Fourteen Payments.	Seven Payments.		
21	£1 16 3	£2 10 6	£3 4 11	£5 10 0	£33 0 1	21
22	1 16 9	2 11 0	3 5 9	5 11 0	33 5 10	22
23	1 17 2	2 11 6	3 6 5	5 12 1	33 11 2	23
24	1 17 7	2 12 1	3 6 11	5 13 1	33 16 5	24
25	1 18 0	2 12 6	3 7 3	5 14 0	34 2 0	25
26	1 18 6	2 13 0	3 7 10	5 14 11	34 8 2	26
27	1 19 2	2 13 6	3 8 7	5 15 11	34 16 1	27
28	1 19 11	2 14 1	3 9 5	5 17 1	35 4 9	28
29	2 0 8	2 14 8	3 10 3	5 18 6	35 14 1	29
*30	2 1 6	2 15 4	3 11 2	6 0 1	36 4 0	*30
31	2 2 6	2 16 2	3 12 1	6 1 10	36 14 6	31
32	2 3 5	2 17 1	3 13 2	6 3 8	37 5 5	32
33	2 4 6	2 18 0	3 14 4	6 5 8	37 17 2	33
34	2 5 7	2 19 0	3 15 7	6 7 9	38 9 7	34
35	2 6 10	3 0 2	3 16 11	6 10 0	39 2 9	35
36	2 8 2	3 1 5	3 18 4	6 12 5	39 16 11	36
37	2 9 8	3 2 9	3 19 11	6 15 0	40 12 4	37
38	2 11 3	3 4 3	4 1 7	6 17 9	41 8 7	38
39	2 12 11	3 5 9	4 3 4	7 0 7	42 5 4	39
†40	2 14 9	3 7 5	4 5 2	7 3 7	43 2 10	†40
41	2 16 8	3 9 2	4 7 2	7 6 8	44 0 11	41
42	2 18 8	3 11 1	4 9 3	7 9 11	44 19 9	42
43	3 0 11	3 13 1	4 11 5	7 13 3	45 19 3	43
44	3 3 3	3 15 3	4 13 10	7 16 9	46 19 7	44
45	3 5 9	3 17 6	4 16 4	8 0 7	48 [illegible] 8	45
46	3 8 5	4 0 0	4 19 1	8 4 [illegible]	[illegible]	[illegible]
47	3 11 5	4 2 8	5 2 [illegible]	[illegible]	[illegible]	[illegible]
48	3 14 8	4 5 8	[illegible]	[illegible]	[illegible]	[illegible]
49	3 18 1	4 8 [illegible]	[illegible]	[illegible]	[illegible]	[illegible]
50	4 1 7	4 12 1	[illegible] 12 4	9 2 10	[illegible] 19 3	[illegible]
51	4 5 6	4 15 5	5 16 1	9 7 11	55 4 5	51
52	4 9 5	4 18 10	5 19 11	9 13 1	56 9 0	52
53	4 13 5	5 2 5	6 3 11	9 18 3	57 12 11	53
54	4 17 8	5 6 3	6 8 0	10 3 5	58 17 2	54
55	5 1 11	5 10 2	6 12 1	10 8 6	60 0 8	55
56	5 6 4	......	6 14 9	10 13 7	61 3 8	56
57	5 10 11	......	6 18 8	10 18 8	62 6 5	57
58	5 15 9	......	7 2 9	11 3 10	63 9 4	58
59	6 1 0	......	7 7 3	11 9 0	64 12 11	59
60	6 6 7	......	7 12 0	11 14 3	65 16 9	60

Example.—A person of 30 may thus secure £1000 at Death, by a yearly payment, *during life*, of £20 : 15s. [illegible] Premium, if paid to any other of the Scottish Mutual Offices, would secure £800 only, instead of £1000.

[These Rates are about as low as the usual *non-participating* Rates of other Offices, which are expected to yield a surplus and whose sufficiency is *guaranteed.*]

[illegible] If unwilling to burden himself with payments during his whole life, he may secure the same sum of [illegible] *twenty-one* yearly payments of £27 : 13 : 4—*being thus free of payment after age 50.*

[illegible] the [illegible] *age* 60, is, for £1000, £33 : 14 : 2, being about the same as most [illegible] be paid [illegible] term of life.

the morning of the 24th to 41 oz. as measured up to the morning of the 25th.

It may seem strange that a patient receiving so little food of any kind should have continued to pass the very large quantities of urine noted above; and even if the fluid from the enemata might account for the quantity of the urine, what, it may be asked, accounted for the specific gravity, which was seldom very low, usually ranging from 1015 to 1025? The explanation is probably to be found in the progressive emaciation, so that a large and strong young man was reduced in two months to an extremely wasted condition. During this time the diet was extremely spare, and the excretions from the bowels may be set down as slight; for although large motions were repeatedly passed in the intervals of an improvement, these were balanced to some extent by correspondingly larger quantities of food which could be then allowed. The loss by vomiting was likewise of little importance, for it was neither excessive in amount or duration at any time. The loss of body-weight and the extreme emaciation may serve to account for the secretion of an abundant urine fairly supplied with solids; and it is worthy of note in this connection that the temperature during his residence never rose above 100° F., except on half-a-dozen days near the beginning of his illness, and that the figures rather showed a subnormal range It is proper to state in connection with this subject of the secretion of urine, that at the post-mortem examination, although there was little or no disease of the kidneys themselves, the upper parts of both ureters were somewhat dilated; at the edge of the proas tendon at the brim of the pelvis there was an unusually sharp angle, and this appeared to have presented an obstruction; the pelves of both kidneys were dilated, especially the right one, but only a very slight wasting of the kidney from dilatation of the calyces had occurred.

The treatment of the patient, apart from the spare diet, the nutrient enemata, and the frequent use of large watery injections into the bowel, consisted in the use of belladonna and morphia. The belladonna was given in the form of pill; half-grain of the extract with half-grain of the powdered leaf every three hours. This was begun on October 8th, and continued till

October 11th, when the frequency was reduced to every six hours, and at this rate it was continued till October 22nd; it was noted on that day that he was rather delirious, or at least very confused; and although other possible causes existed for such disturbance, it was thought best to omit the belladonna, at least for a time. It was resumed on the fourth hour in the same dose every six or eight hours, till November 9th; it was resumed on November 18th, and finally stopped on November 30th.

In addition to this, belladonna was applied externally for a short time, Squire's liniment being rubbed into the skin of the belly, but as it seemed to irritate the patient, it was soon stopped, and only rubbed on the back, where the pain was often complained of as severe. Notwithstanding a pretty full trial of this remedy we could not see that belladonna, either internally or externally, lessened the spasms or the sufferings of the patient.

Morphia was used pretty freely from the first, and was continued in very varying doses throughout. At first half-grain morphia suppositories were used; but as these began to fail in the relief of the pain, subcutaneous injections of morphia were resorted to, and the first (half-grain dose) was noted as given on the 10th October. The amount and the frequency of the subcutaneous injections had to be increased, but accurate notes of the quantities are only available from October 26th. It may be stated, however, that even on October 15th (a week after admission) he had three doses of a grain each within twelve hours; and on October 21st the amount *given at one dose* had to be increased to two grains to produce any relief. On the 26th and 27th October (just before one of the temporary improvements) the doses reached a maximum, as much as nineteen grains of hydrochlorate of morphia being injected within the twenty-four hours on these days Of course an effort was made to avoid any unnecessary excess, but the sufferings of the patient were such that it could not be withheld. The following notes show the doses:—

Oct. 26.—6.30 A.M. 4 grs.; 9.30 A.M. 3 grs.; 1.45 P.M. 3 grs.; 5 P.M. 3 grs. 7 P.M. 3 grs.; 9.45 P.M. 3 grs. = in all 19 grains of morphia.

Oct. 27.—12.25 A.M. 3 grs.; 4 A.M. 3 grs.; 7 A.M. 5 grs.; 9.30 A.M. 5 grs.; 3.30 P.M. 3½ grs. = in all 19½ grs. of morphia.

The doses of morphia were aimed at the amount necessary for producing decided relief; but this relief was often of short duration, and so the dose had to be repeated again and again on certain days. The following notes are copied from the record which was kept from October 26th onwards :—

October 26	19 grains.
27	$19\frac{1}{2}$,,
28	16 ,,
29	11 ,,
30	$8\frac{1}{4}$,,
31	6 ,,
November 1	$3\frac{1}{2}$,,
2 to 21	Varying quantities, from $\frac{1}{2}$ grain to $2\frac{1}{2}$ grains daily.
22 to 26	From 3 to 5 grains daily.
27	6 grains
28	$6\frac{2}{3}$,,
29	6 ,,
30	16 ,,
December 1 to 5	From $1\frac{1}{2}$ to $\frac{1}{2}$ grain, and then up to $1\frac{2}{3}$ grains.
6 to 9	During terminal diarrhœa and collapse 2 to 5 grains daily.

As already stated, the symptoms of obstruction gave way in a very marked form on October 31st, and it was hoped that the illness had come to a favourable termination. But although the pains had ceased about midday on the 31st October, the patient was found in a very prostrate condition on November 1st, notwithstanding that he had had a good night's sleep without any morphia. There had, indeed, been a little more tendency than usual to sickness or retching, and on this account the food given by the mouth had been curtailed even further, but it seemed to me that most of the exhausted and sunken or collapsed appearance arose from the want of the morphia. My assistant, instructed all along to be guided in his doses by the amount of pain present, not unnaturally supposed that as all paroxysms had ceased no more need be given. Accordingly, on October 31st, he had had $3\frac{1}{2}$ grains at 1.40 A.M., and $2\frac{1}{2}$ grains at 11.30 A.M., but none after that time; so that when seen at the visit hour next day nearly twenty-four hours had elapsed without his usual stimulant. Acting on this idea, he was

ordered at once a grain of morphia by the skin, and this was to be repeated if it seemed to agree. The effect of his first dose was to render the patient much more comfortable; and the $3\frac{1}{2}$ grains noted on the 1st November were really given as a stimulant. This was gradually reduced, although, on some days, a return of the pain demanded larger quantities; and the sudden rise from six to sixteen grains, with a return of the violent spasmodic pains, was borne without any unusual narcotism.

The effect of the large doses of morphia on this patient seemed to consist almost solely in relieving the abdominal spasms and pain. Even the pupils were not contracted. At first it was supposed that the tolerance of the morphia and the absence of contraction in the pupils might be due to the simultaneous administration of pretty full doses of belladonna; but in a subsequent part of the illness, when both the internal and external use of this drug was stopped, there was no change observed in this respect.

Two peculiar symptoms may be mentioned here as possibly connected with the prolonged use of morphia in large doses in this case, although there is no real evidence that any such connection existed. The one was the occurrence of patches of anæsthesia on the thighs; this was noticed only towards the end of the case, but had existed for some little time; indeed the patient had frequently complained of want of sensation in his legs and feet, but during the height of the illness little attention was paid to this, as it was thought to depend very likely on the tension and pressure in the abdomen. In December, however, a very definite area was found to be devoid of sensation on the anterior aspect of the left thigh, and a similar but slighter defect existed on the right; the defective sensation was so great that the needle of a subcutaneous syringe could be introduced in this place without its being perceived by the patient.

The other feature referred to was the appearance of patches of bluish discoloration on the skin of the belly, back, and legs; they seemed to be due to ecchymosis; they were noticed first early in November; they persisted even after death, and are noticed in the pathological report as numerous livid spots and patches on the skin of the trunk and limbs.

The question of surgical interference was frequently and anxiously considered during the progress of this case. It was formally raised as early as October 18th, when I sought the advice of my medical and surgical colleagues. The nature of the mischief was at that time so obscure, and the proper surgical procedure so doubtful, that I could not see my way to recommend any operation. The points which guided me were the following:—the evidently incomplete nature of the obstruction, as small motions were occasionally obtained by the enemata, and the absence of any very violent or fæcal vomiting. This seemed to me to leave little hope of a successful issue if the abdomen were opened and the obstruction searched for, as proposed by one of the surgeons; and in view of the nature of the case, as now known, this operation would have been very disappointing.

The other operation proposed, opening the bowel in the right groin so as to relieve the distended intestine of its contents, seemed to me, in view of the incomplete obstruction, apt to aggravate the danger to the patient and lead, in all probability, to no real cure. In view of the ultimate issue of the case, it may be admitted that this operation might have relieved the patient of his paroxysms of pain more efficiently than was possible by means of morphia; perhaps the relief thus obtained might have counterbalanced the grave inconveniences of an artificial anus, and, as the case was beyond the possibility of a cure, the risk in this respect may be almost set aside.

ON THE EXHIBITION OF PURGATIVES IN TETANUS.

BY ALFRED BOON, F.R.C.S.

St. Kitts, West Indies.

ON referring to the section on tetanus in the works on medicine and surgery within my reach, I find them, whatever else they may differ about, almost unanimous in recommending active purgation as one of the leading points in the treatment of the disease. When details are gone into, croton-oil, or calomel, or some other energetic drug is suggested, and, to assist it in its action, enemata are recommended by some writers.

Now the first few cases of tetanus treated by me in the West Indies had their full share of calomel and jalap and croton-oil, and so on. They all died. About this time I looked carefully through the notes of a great number of cases of tetanus, and I observed that in many cases the patient had been doing very well until it had occurred to the surgeon that his bowels wanted opening, whereupon a dose of some powerful purgative, followed so frequently as to be more than a mere coincidence by an exacerbation of all the symptoms often speedily ending in death. Coupling this with my own experience, I came to the conclusion that this traditional treatment was altogether a mistake. Since then I have treated many cases of tetanus without purgatives, and have had the satisfaction of seeing a large proportion of them recover.

The following extract from a lecture delivered by Mr. Skey many years ago throws some light on the origin of this method of treating the disease. He says, "I remember a case of tetanus treated by Mr. Abernethy in St. Bartholomew's Hospital with calomel and jalap, in doses of from one grain to five. The case was a severe one, and arose, if I recollect rightly, from a wound

about the hand. The man's bowels were greatly constipated. The purgatives, given every three hours in repeated doses, at length operated freely, producing several offensive evacuations. Relief from the spasm followed, and the man recovered. Mr. Abernethy from that time henceforth in his surgical lectures recommended to his pupils the adoption of the particular agent he had himself found so successful in the above case, attributing the disease to a constipated condition of the alimentary canal. And yet tetanus is a rare affection, while constipation in every form and degree is of common occurrence." Exactly so.

I consider the question of the administration of purgatives in tetanus to be of some importance; indeed, when the want of success that too often follows our efforts to combat this disease is remembered, any discussion opening up new ground with regard to its treatment cannot fail to be of interest. I have had some experience in the matter, and it is without hesitation that I protest against the present plan of indiscriminately administering violent purgatives.

We have but to look at the *modus operandi* of these drastic purgatives. Their effect is produced "by a direct or local action on the mucous membrane of the digestive canal, in the same manner as irritating or indigestible articles of food occasion diarrhœa." Now it is admitted that a tetanic patient should be carefully guarded from every external source of irritation, for it is well known to those who have seen anything of the disease that the least noise, flash of light, or in short anything that makes a sudden and distinct impression on the patient's sensorium, will bring on a spasm which may be fatal, and must at any rate help to exhaust the strength; for instance, I have known the cold fingers of the surgeon feeling the pulse give rise to a severe spasm.

This being so, it is matter for surprise that drugs acting in the manner indicated above should be so persistently recommended and prescribed.

Not many years ago it was proposed, and actually carried into practice, that the whole of the patient's spine should be blistered; and I believe that one or two patients actually recovered in spite of this treatment. Probably, nowadays, no one would venture to propose the rubbing in of croton-oil liniment into the back of a tetanic patient; yet there is no

hesitation in applying the same irritating substance to the patient's gastric and intestinal mucous membrane, and setting up an irritation which cannot but be hurtful to the patient's chances of recovery. It seems to me that, of the two evils, the constipated bowels are by far to be preferred.

If violent purgatives may do so much harm, the question arises whether we should entirely exclude the use of purgatives from our treatment. I am satisfied that in a large proportion of cases the bowels will act of themselves if left alone, and if no preparation of opium be given. The treatment that I have advocated in this journal and elsewhere, consists of the exhibition of large doses of chloral and Indian hemp: with this I have rarely had occasion to order purgatives, and to this in some measure is probably due its success in my hands. No doubt, however, it is occasionally necessary to open the patient's bowels. He is restless, and complains of abdominal distress, quite distinct from the epigastric pain peculiar to tetanus, and a desire to go to stool without being able to pass any fæces. Under these circumstances only do I consider the administration of laxatives justifiable in acute tetanus. The only one I have prescribed in such cases and can therefore recommmend is castor-oil, in drachm doses, at pretty frequent intervals: it acts without producing abdominal irritation or any general disturbance of the system: it is well to add a few minims of tincture of hyoscyamus to each dose.

With regard to the use of enemata: for obvious reasons they are calculated to do more harm than good, and should be ordered only under very exceptional circumstances, if at all.

The same may be said of hypodermic injections. I have seen cases recorded in which the drugs were administered altogether hypodermically, and the unfortunate patients were literally riddled. In one or two cases it was casually mentioned that each prick of the needle brought on a spasm!

In conclusion, I can with confidence say that never have I had reason to regret that I did not purge a patient suffering from tetanus, but I have more than once had occasion to repent following the practice so emphatically laid down in most, if not all our text-books.

Reviews.

Eyesight: Good and Bad. A Treatise on the Exercise and Preservation of Vision. By ROBERT BRUDENELL CARTER, F.R.C.S., with Illustrations. 8vo. pp. 265. London: Macmillan & Co.

IN his preface the author states that a large portion of the time of every ophthalmic consultant is occupied, day after day, in repeating to successive patients precepts and injunctions which ought to be universally known and understood. The present work contains an endeavour to make these precepts and injunctions, and the reasons for them, plainly intelligible to those who are most concerned in their observance. Intended, as the work must therefore necessarily be, for many who have had no training either in physics or physiology, it would be impossible for its readers to understand the aberrations of vision, and the reasons given for certain lines of treatment, without a previous knowledge of rudimentary optics and the structure of the eye. The work therefore begins with chapters on the structure of the eye, on light, on the forms and properties of lenses, on the formation of images in the eye, and on refraction and accommodation, before proceeding to discuss abnormal conditions, beginning with presbyopia. Then follow chapters on single vision with two eyes, and convergence: defects of vision produced by faulty shape of the eyeballs; myopia, hypermetropia, and astigmatism: asthenopia, or weak sight: colour, colour-vision, and colour-blindness: the care of the eyes in infancy and childhood: the care of the eyes in adult age; natural and artificial illumination; accidental injuries; the influence upon sight of the general health and habits of living: contrivances for saving visual effort: practical hints on spectacles. Under the head of presbyopia, the author does good service by exposing the falsity of the common and widely spread belief that strong glasses tend to cause blindness—a belief which, sometimes at least, leads people to object to glasses altogether, or to do without them as long as they can,

when their eyesight would be very much benefited by their use. The reason of this belief is that the rapid failure of accommodation is a premonitory symptom of glaucoma, and the demand by persons suffering from this disease for glasses of constantly increasing power led to the belief that the glasses themselves were the cause of the failure of vision. The chapter on "defects of vision produced by faulty shape of the eyeballs, myopia, hypermetropia, and astigmatism," ought to be read, not only by every member of the School Board, but by every one who is interested, either directly or indirectly, in the education of children. There can be no doubt whatever that badly lighted and badly fitted schools are an arrangement for producing myopia. The bad light and bad fittings alone are not to bear the whole blame, although they deserve a great deal. Another cause of the myopia is the feeble and easily extensible character of the tunics of the eye, which allows of their gradually stretching in the antero-posterior direction, and this gives rise to myopia. This debility should be treated not only by food, tonics, and exercise, and an ample supply of pure air to the school-rooms, but also by an abbreviation of the tasks. In an interesting experiment made by Mr. C. Paget, a portion of the children in a school were made to work only half time at their lessons, spending the remaining half in garden work. In a short time these children altogether outstripped, in their school work, those who devoted, or were supposed to devote, twice as much time to it.

The chapter on asthenopia, or weak sight, is also very instructive. It almost always depends on a want of harmony between the effort required for accommodation and that for convergence. It chiefly occurs in patients of the better classes, and sometimes gives rise not only to local irritation of the eyes, but to the fear of serious brain-disease, the mere attempt to read sometimes producing giddiness, headache, palpitation of the heart, and sickness. For such cases complete rest of the eyes is often prescribed, but erroneously; the proper treatment being to correct any defect in the eyes by spectacles, and afterwards to train the muscles of the eyes up to their work by gradually increasing exercise, always taking care to keep it short of fatigue.

In the chapter on care of the eyes in childhood, the author notes that in the experience of ophthalmic surgeons it is exceptional to meet with a child suffering from defective vision who has not, before the defect was discovered, been repeatedly and systematically punished by teachers or schoolmasters for supposed obstinacy or stupidity, whereas the first question regarding the apparently obstinate or stupid child should always be, "Can he see perfectly?"

The work is one which contains, in an exceedingly clear and agreeable form, information not readily to be had in ordinary text-books, and it will be exceedingly useful, not only for lay readers who suffer from defective vision, and to medical men and their patients, but to every one who has anything to do with education.

Practical Histology and Pathology. By HENEAGE GIBBS, M.B. 8vo. pp. 107. London: H. K. LEWIS.

THE object of this work is to give the practitioner and student of medicine a few concise and simple methods for preparing various tissues and pathological products for examination with the microscope. The book is no mere collection of various processes given by different people The author has only given those which he finds by personal experience to be the best, leaving the others out, and thus avoiding the risk of confusing the reader. The chapters on staining are especially full, and in no other work with which we are acquainted will the reader find such ample information upon this important part of the preparation of tissues for the microscope. This little work contains no padding: it consists entirely of precise instructions by one who is evidently master of the subject, and we know no work which we can more highly recommend to either student or practitioner.

Annals of Chemical Medicine; including the Application of Chemistry to Physiology, Pathology, Therapeutics, Pharmacy, Toxicology, and Hygiene. Edited by J. L. W. THUDICHUM, M.D. Vol. I. pp 356, with several Woodcuts. 8vo. price 14*s*. cloth.

THE literature of physiology has grown to such large dimensions that any work which is intended to summarise portions of the subject and place them before the general reader in a condensed form is received with welcome. By the term "general reader" must be understood one who, requiring to keep himself *au courant* with what is happening, is too much occupied professionally or otherwise to be able to read original papers at full length: to such a person a work which adequately fulfilled the functions suggested by the title, *Annals of Chemical Medicine*, would be extremely useful.

The first volume, of a presumable series, with the above title unfortunately does not carry with it the promise of great utility; and the reasons are not difficult to point out. A very short perusal of the book shows that its intention is to a considerable extent polemical: this is sufficiently indicated in

the preface, where the author speaks in strong, and shall we say unfair, terms of the acquirements and behaviour of those who do not quite agree with him. Nowhere is it better shown, however, than in the chapter devoted to "Protagon." It is customary to give the names of both authors, when quoting a paper which is the result of the conjoined labours of two observers; moreover the tone of the concluding paragraphs is scarcely appropriate when speaking of investigators who are regarded with respect by their fellow-workers.

The first two and other chapters devoted to points in connection with the chemistry of proteids are good, and will be read with interest; this is especially the case with the account given of Schutzenberger's valuable researches on the decomposition of proteids. Chapter III, treating of the action of ferments on starch, and the pages devoted to chitin, require some mention; and of these the references to past researches will be found to be by no means the least valuable. The portion which treats of the bile-pigments is useful, as containing in a compact form the author's own experiments and views on these bodies. The last chapter is purely controversial on the same subject. The life of Mayer, though interesting, is perhaps a little out of place.

We are sorry not to have been able to accord greater praise to this book, since there is need of a work of its kind. The controversial nature of the contents is somewhat opposed to the title, and the latter should be altered if the author intends to use this work so largely as a means of enunciating his own special views and, in some cases, of disparaging those of others.

Fistula, Hæmorrhoids, Painful Ulcer, Stricture, Prolapsus, and other Diseases of the Rectum, their Diagnosis and Treatment. By WILLIAM ALLINGHAM, F.R.C.S., Surgeon to St. Mark's Hospital for Fistula, &c. Third edition, partly re-written. 8vo pp 325. London: J. and A. Churchill, 1879.

Cancer of the Rectum, its Pathology, Diagnosis, and Treatment. By W. HARRISON CRIPPS, F.R.C S, Surgeon to the Great Northern Hospital, &c, &c. Fcap. 8vo. pp. 191. London: J. and A. Churchill, 1880.

IN the third edition Mr. Allingham has added considerably to some parts of the former work, but has not impaired its usefulness as a practical manual. The treatment of hæmorrhoids, and of hæmorrhage after ligature of hæmorrhoids, is especially valuable, for it is evidently written by one who has himself felt and conquered the difficulties of which he writes. In the treatment of fissure of the anus the author has lately substituted for the cutting operation dilatation of the sphincter, modified,

however, in a fashion which appears to render it less objectionable than the proceeding of Dolbeau.

The chapter on cancer of the rectum contains more matter than in the previous edition, notably with regard to removal of the lower portion of the bowel; but this part of the book, although very good, is inferior in excellence to the work of Mr Cripps, to whom we believe the credit is due of having revived the operation of excision of the rectum in this country. Every chapter of Mr. Cripps's book is worthy of perusal, not excepting the Introduction, which contains a good statement of the arguments for and against the theory of the inheritance of cancer. The pathology of cancer of the rectum is very fully treated, both generally and microscopically. In relation more particularly to the minute characters of the disease one cannot but be struck by the originality of the views expressed and by the clever and admirably executed sketches with which the author has illustrated his opinions The whole of this portion of the work betokens much thought and long study devoted to an aspect of the disease which has been much neglected hitherto, and cannot fail to raise the reputation of the author as a scientific surgeon. The chapters on diagnosis are good and useful, but we may pass them by for those on treatment, which contain the best account with which we are acquainted of the operations for removal of the rectum, and of the conditions under which this may be accomplished with a fair expectation of success. The palliative treatment of a patient suffering from cancer of the rectum and the operation of colotomy are not forgotten; but it is evident Mr. Cripps desires to impress us with the advantages of excision wherever it can be practised, for he lingers lovingly over the operation until he has at length convinced us that we have too long neglected it.

We hope in a second edition he will render his work still more complete by an additional chapter on the natural course pursued by the disease, and furnish us with some account of the tissues and organs usually affected when it becomes generalised.

While fully admitting the value of both these books, we cannot but take exception to the manner in which they are written; for the former is in bad taste, the latter carelessly written. The frequent repetition of the pronouns "I" and "my" in Mr Allingham's book is unnecessary and very distasteful, while in the section on the treatment of piles by clamp and cautery the covert attack on one whom we presume he would consider "an able fellow-worker" is unpardonable.

We draw attention especially to these points, because an impression appears to prevail at present that inferior work is not worth good composition, and that good work is not damaged by careless writing.

Clinic of the Month.

Iodoform in Chronic Otorrhœa.—American physicians have advised the use of iodoform in otorrhœa Czarda has tried it with success in the otiatric clinic of Prof. Zanfal of Prague, and gives his results in the *Wiener Mediz. Presse* He has employed the remedy in the cases of twenty-one patients, whose ages varied from four to thirty-three years. Most of them had suffered for months, some for years. The otorrhœa was consecutive to scarlet fever, measles, typhus, &c. In most of the cases the membrana tympani was more or less completely destroyed: in the others it was perforated. The mucous membrane of the aerial passages was red and swollen: the secretion was very abundant in many cases. in five of the eighteen cases both ears were affected. In eight cases instillations of a solution of nitrate of silver had been used for months: in two cases powdered alum had been employed. Small quantities of powdered iodoform, after the ears have been thoroughly cleansed, are at first blown into the affected ear, later when the suppuration has diminished and there is marked amelioration, a plug of cotton-wool imbued with iodoform is introduced into the cavity of the tympanum. The insufflated powder or the plug of cotton-wool is left in its place for three or four days: each time it is renewed the ear is carefully cleansed. The suppuration diminishes rapidly from the first application of the remedy. The pus has no fœtid odour, even after the prolonged presence of the iodoformed plug. Cure generally takes place in from one to four weeks, the mucous membrane of the auditory passages gradually resuming its normal character. The iodoform acts as a disinfectant, a resolvent, and a protective. It has besides the advantage of not forming with the pus fœtid concretions as is the case with alum. The odour of iodoform is easily covered by the addition of camphor, ethereal oil of bitter almonds, tannin, or a few drops of fennel or peppermint. (*The Medical Press and Circular,* Sept 1, 1880.)

On the Curability of Attacks of Acute Phthisis.—Dr. McCall Anderson read before the recent meeting of the British Medical Association at Cambridge a paper in which he stated that by the term acute phthisis he meant an acute pulmonary affection, accompanied by high and continuous fever, running a rapid course, and leading invariably to more or less destruction of lung tissue if the patient survived long enough. He recognised three varieties of the disease. (1) Acute pulmonary tuberculosis; (2) Acute pneumonic phthisis; (3) Acute pneumonic phthisis, complicated secondarily with the development of grey miliary tubercles. He thought it impossible to distinguish the second from the third variety during life, but that the first might be suspected when the disease set in suddenly, with high fever, great prostration, profuse perspiration, lividity and great acceleration of breathing, and when these symptoms were out of all proportion to the results obtained from a physical examination of the chest. Having given extracts from the writings of Walshe, Trousseau, and others, showing that the profession was very hopeless as to such cases, he pointed out that in a good many instances he had obtained excellent results from treatment of which the following was an outline Careful, skilled nursing, with constant feeding and stimulants in small quantities often (from 4—10 oz. daily); (2) Each night a subcutaneous injection of $\frac{1}{100}$ to $\frac{1}{80}$ grain of atropin; (3) Remedies specially adapted to the removal of fever, (*a*) ice cloths to the abdomen; (*b*) quinine 10 to 30 grains in a single dose, once daily; (*c*) a pill composed of one grain of quinine, half a grain of digitalis, and from a quarter to three-quarters of a grain of opium, every four hours. In addition to this, special symptoms, diarrhœa, constipation, and the like, must be treated on ordinary principles, and of course the treatment indicated must not be used in a mere routine way, but adapted to the surroundings of each individual case. (*The British Med. Jour*, August 28, 1880.)

On the Treatment of Rheumatic Fever.—From a consideration of the reports of a number of cases of rheumatic fever which have been recently treated with salicin, salicylic acid, and salicylate of soda, Dr. Young has drawn the following conclusions:—These remedies are useful in some cases of rheumatic fever. The cases in which they appear to do most general good are those that have no tendency to heart complications, the temperature not being high, and the patient being in his first attack. Such patients are relieved of the pain and swelling in from thirty-six hours to six days, and convalescence is completed in from ten to twenty-five days; whilst the duration of the illness, previous to the adoption of this mode of treatment, does not

influence the result. Patients that have suffered from previous attacks, when murmurs in the region of the heart are left, are benefited by these preparations as far as their recent symptoms are concerned, and in as short a time as in their first attack, but their convalescence is more tedious. These preparations are useless either as relievers of pain, or as reducers of temperature, in cases which are complicated with pericarditis, even when the temperature is not high; nor does their early administration, and in large doses, keep off this complication. They also appear to be useless in cases that have a temperature higher than 104° 5. Contrary to the conclusion come to by Dr. Maclagan, the large doses recommended by him are unnecessary, ten to fifteen grains every one, two, or three hours being sufficient In cases where these drugs do not seem to suit, the most commonly observed symptoms are noises in the ears, accompanied with deafness and vomiting (*The Dublin Jour. of Med. Sci.*, September, 1880.)

On the Anti-Malarial Action of the Cinchona Compounds.—Dr. Maclagan believes that malaria exists in the ground, emanates from it, and infects the atmosphere in the neighbourhood; it is due to a poison which is in the ground, and which infects only that part of the atmosphere which is near the ground. The chief area of malarial infection is the area of vegetable influence—the ground in which the roots are, and the atmosphere immediately around the leaves. Dr. Maclagan believes that malarial poisons are organisms, and that their modification is intimately associated with, and dependent on, their organic growth. In intermittent fever quinine actually cures, as it puts a stop to the whole morbid process and all that constitutes the disease. This action of quinine in arresting the course of intermittent fever cannot be explained solely by its febrifuge properties, since it possesses the power of preventing such fever. Given during the intermission, it prevents the fever from coming on; taken regularly by those living in the malarial districts, it prevents them suffering from the action of the poison of intermittent fever. It appears that quinine acts by destroying the malarial poisons, and not by any action that the drug exerts upon the system generally; and this view is further supported by the experiments of Binz, which tend to show that quinine possesses in a remarkable manner the power of destroying many minute organisms, and of arresting processes dependent on their growth and propagation. (*The Lancet*, August, 1880.)

Subcutaneous Injection of Ether in Sciatica.—Dr. Comegys recommends hypodermic injection of sulphuric ether for the treatment of sciatica. He cites two cases, one in detail, which he has cured by this plan. Three drops of ether are injected at intervals of twelve hours. The injection need

not be a deep one; and though it causes a momentary sharp pain, it does not bring on any consecutive unpleasant effects. Dr. Comegys is inclined to think that the same injection might be successful in the case of tic-douloureux, for which Dr. Marino recommends hypodermic injection of ergotin. (*The Brit. Med. Jour.*, August 28, 1880.)

On Milk Diet in Cardiac Lesions.—M. Potain read before the recent meeting of the French Association for the Advancement of Science, at Rheims, a paper upon milk diet, which he finds particularly useful in cases of secondary disease of the heart, such as hypertrophy or simple dilatation, the result of gastric or renal affections. This regimen modifies on the one hand the state of the kidney, and on the other that of the stomach, since it gives the latter organ perfect rest, and for this reason the diet should be absolute and should be continued for a more or less prolonged period This treatment may also be successfully adopted in cases of simple palpitation due to gastric troubles; and its diuretic effects may be made use of when there is dropsy, due to disease of the kidneys. (*Gaz. Hebdomad*, August 27, 1880.)

Treatment in Accidental and Unavoidable Hæmorrhage. — Dr. Keith Norman Macdonald read a paper before the Obstetrical Section of the British Medical Association, in which he remarked that in treating cases of accidental and unavoidable hæmorrhage, no reliance could be placed on astringents, opiates, the application of cold, and plugging, especially when the pregnancy had advanced beyond the seventh month. Plugging was useful in some cases, but it was seldom efficiently carried out, and there was no security against blood accumulating within the uterus. It should only be used as a very temporary measure. The following is an outline of the treatment to be adopted. All cases of hæmorrhage occurring before the fifth month should be treated as ordinary abortions, laying particular stress upon prolonged rest in bed if the hæmorrhage had been arrested. If it continued, the expulsion of the ovum should be hastened by ergot, and rupture of the membranes. After the sixth month, in cases of accidental hæmorrhage, if rest and astringents failed, labour should be brought on either by rupturing the membranes or by the introduction of an elastic catheter into the uterus This might be followed by the use of Barnes' bags. In cases of placenta prævia, the treatment should be more prompt and decisive. At whatever period the bleeding occurred, if the placenta could be felt presenting, complete delivery should at once be brought about by rupture of the membranes, dilatation by Barnes' bags, and turning. (*The Brit. Med. Jour.*, Sept. 4, 1880.)

The Treatment of Sciatica.—Dr. Smythe finds that the hypodermic injection of atropin is of great value in the treatment of sciatica. The remedy must be used in full doses. If less than $\frac{1}{24}$—$\frac{1}{12}$ of a grain is injected the success will only be partial, and, after the patient has suffered from the drug once without relief, it may take some persuasion to induce him to undergo it again. In one case Dr Smythe tried the effect of a small dose, $\frac{1}{40}$th grain; the relief was only partial, and it was several days before the consent of the patient was obtained for a repetition of the remedy. The $\frac{1}{16}$ of a grain produced a permanent cure, since which time he has never used less than that quantity. The drug must not be employed when the system is under the influence of opium or any of its preparations, owing to the antagonism known to exist between these drugs. If any dangerous symptoms should appear, they are readily counteracted by any of the preparations of opium. In none of the cases cited was it necessary, however, to administer the antidote. In two cases of gonorrhœal rheumatism in which atropin was employed no permanent relief followed. The medicine was administered three times in one case, and twice in another, producing its full constitutional effect each time, but without alleviation of the distressing symptoms. (*The St. Louis Medical and Surgical Journal*, September 5, 1880.)

Treatment of Convulsions in Children.—M. Simon recommends careful exclusion of excitement and attention to the digestive organs for the purpose of preventing convulsions in nervous children At the same time he gives bromide of potassium.

℞ Orange flower water, 120 grams.
Bromide of potassium, 2 grams.
Cherry laurel water, 15 grams.
Ether, 2 or 3 drops.

Of this mixture he administers the fourth part daily, suspending its use after four or five days. The attack itself generally follows on indigestion. He then prescribes as a purgative enema—

℞ Sulphate of soda, 10 grams.
Senna leaves, 8 grams.
Water, 150 grams.
Honey of mercurialis perennis, 30 grammes. ♏

After that he gives an emetic, if the convulsion is already past, and then a few whiffs of ether. The doctor's duty is not yet over; there are still three remedies to be tried. He prescribes first an enema, given after the bowels have been opened—

℞ Water, 100 grams.
Musk, 10 or 15 centigr.
Chloral, 50 centigr.
Yolk of egg, ½. ℳ

Then a mixture as follows—

℞ Bromide of potassium, 1·50 centigr.
Lime or orange-flower water, 120 grams.
Cherry laurel water, 15 grams.
Ether, 2 or 3 drops
Syrup of codeia, 5 grams.
Simple syrup, 30 grams. ℳ
Sig A coffeespoonful every hour.

If the convulsions last till the second day, he prescribes mustard baths, repeated every three or four hours After some hours, if urine has been passed, the attack is at an end; if not, the treatment must be continued, for the attack may recommence. A great deal of urine is passed at the end of a nervous attack. If it is not all ended put a blister on the nape of the neck, for no longer than three hours. Envelop the lower limbs in cotton wool, and cover them with a large stocking. (*La France Médicale*, No. 20, 1880; *The Glasgow Medical Journal*, July, 1880.)

The Treatment of Gonorrhœa.—Mr. W. Watson Cheyne, Assistant-Surgeon to King's College Hospital, has carried out a series of experiments in the treatment of gonorrhœa which are worthy of being extensively known. It has been demonstrated by Neisser that organisms are present in great abundance in gonorrhœal pus, and Mr. Cheyne has verified the observations by inoculating cucumber infusions with some of the discharge. Acting upon the known effects of certain antiseptic materials, he decided to adopt iodoform and oil of eucalyptus. In order to bring them into certain contact with the suppurating surface, he had bougies made of these materials and cacao butter. The formula is—five grains of iodoform, ten minims of oil of eucalyptus, and thirty-five grains of cacao butter. The bougie is introduced into the urethra, and a strap and pad over and around the orifice retains the bougie there until it is dissolved. After this, an injection of boracic lotion (saturated aqueous solution of boracic acid) or an emulsion of eucalyptus oil (one ounce of eucalyptus oil, one ounce of gum acacia, water to forty or twenty ounces) to be used for two or three days. At the end of that time injections of sulphate of zinc, two grains to the ounce, may be begun. For a day or two the purulent discharge continues, but afterwards it steadily diminishes in amount, becoming in four or five days mucous, and ceasing altogether in a week or ten days. (*British Medical Journal*, July 24, 1880; *The Dublin Journal of Medical Science*, September, 1880.)

Soothing Ointments.—Dr. McCall Anderson recommends the following ointments as being of use in the treatment of diseases of the skin. One of the most favourite remedies in this country is the unguentum oxidi zinci benzoatum of Erasmus Wilson, Bell's formula for which is as follows:—

℞ Adipis præparati, ℥ v.
Gummi benzoin. pulver. ℥ j.

Liquefac, cum leni calore, per horas viginti quatuor, in vaso clauso: dein cola per linteum et adde—

Oxydi zinci purificati, ℥ j.

Misce bene, et per linteum exprime.

To this a drachm of rectified spirit, spirits of camphor, or Price's glycerin, may sometimes be added with advantage. The benzoin prevents the ointment from becoming rancid and irritating, whilst at the same time it imparts to it a certain fragrance It is an excellent preparation, but, owing to the white crust which is apt to form, it is inferior to others when the eruption is situated upon uncovered or upon hairy parts. In such situation, the zinc ointment of Dr. Bulkley is preferable, and is composed of pure carbonate of zinc and the ceratum galeni, in the proportion of half a drachm to the ounce. One of the most valuable of the soothing ointments is the "unguentum diachyli albi" of Hebra, of which the following is the formula:—

℞ Olei olivæ, ℥ xv
Litharg. ℥ iij et ʒ vj.

Coque l. a. in ung. moll., dein adde—

Ol. lavandulæ, ʒ iij.

M. ft. unguentum.

This ointment is likewise unsuitable for hairy parts on account of its matting the hair together. More recently, several varieties of soothing ointments containing oleic acid have come into use, one of the best of which is the "unguentum zinci oleatis," recommended by Dr. Crocker, the formula for which is as follows:—

℞ Zinci oxidi, ℥ j
Acidi oleici, ℥ viij.
Vaselini, ℥ ix.

Rub up the oxide of zinc with the oleic acid, and let it stand for two hours; then place in a water-bath until the zinc is dissolved, add the vaselin, and stir until cold. Instead of this, Dr. Sawyer has recently recommended an oleate of lead ointment, which is composed of lead oleate 24 parts, heavy and inodorous paraffin oil 14 parts. The lead oleate is prepared by heating a mixture of oleic acid and oxide of lead, 1 part of the

former to 8 of the latter. It is prepared in the same way as the last ointment, but it seems to be inferior to it as a sedative application The best soothing ointment is prepared in the same way as the oleate of zinc, and is composed of—

℞ Bismuthi oxidi, ℥ j.
Acidi oleici, ℥ viij.
Ceræ albæ, ℥ iij.
Vaselini, ℥ ix.
Olei rosæ, ♏ v.

Instead of merely rubbing soothing ointments upon the inflamed surface, it is always preferable, when at all possible, to apply them spread thickly upon pieces of linen, which should not be too large, else they do not lie evenly upon the inflamed parts. The application of these ointments is indicated when the eruption is acute and recent; when there is much inflammatory tumefaction or œdema; when, instead of itching, burning heat or pain is complained of; when the part is the seat of vesicles or of pustules; when, instead of being dry, it is the seat of serous or, above all, purulent exudation; or when it is covered with crusts, the result of the desiccation of recent exudation. In cases of tinea sycosis (ringworm of the beard), when the part is swollen and indurated and when burning heat and pain are complained of, the most important part of the treatment consists in the extraction of the hairs. (*The Specialist*, Sept. 1, 1880)

Treatment of Urethritis by Chlorate of Potash.—Dr. J. P. Zeitlin has used this remedy in fourteen cases of uncomplicated urethritis in doses of 3 grams (about 45 grains) per diem, with excellent results. Even after the first few doses the discharge diminished in quantity, and became thinner, while the pain and secretions ceased. No evil consequences followed this treatment. The author ascribes this rapid good effect of the chlorate to the fact that the salt appears unchanged in the urine, and acts locally on the mucous membrane. (*Cbl. f. Chrurg.* Aug. 28, 1880; *The Glasgow Med. Jour.*, Oct. 1880.)

Extracts from British and Foreign Journals.

An Antidote for Carbolic Acid—Dr. Sanftleben of Russia states that sulphuric acid combines with carbolic acid to form a non-poisonous compound In cases of poisoning by carbolic acid, when the patient is seen in time to render an antidote serviceable, he recommends the following:

℞ Acid: Sulphuric: dilut. ʒ ijss
Syrup: Acaciæ: ʒ j
Syrupi simplicis, ʒ viiss.
Sig· A tablespoonful every hour.

—*The Kentucky Medical Herald*, May, 1880.

The Antipyretic Treatment of Relapsing Fever.—Dr. Riess, of Berlin, in a paper on a recent epidemic of relapsing fever in that city, states that he, like other observers, never saw any good results follow the use of large doses of quinine either during the attacks or before the relapse. The salicylate of soda, however, proved decidedly efficient as an antipyretic in a large number of cases. He gave it, as a rule, in doses of ninety grains, both during the first attack and the relapses, and found that, in the majority of the cases, the temperature fell almost to the normal point in from two to six hours. When the drug was administered shortly before the time the crisis was expected, it seemed to shorten the attack. In a few of the cases the drug had but little or no effect. In twenty-six cases the salicylate was administered methodically during the apyrexia, in the hope of preventing the relapses; these patients took ninety grains once or twice a day for from eight to fourteen days, beginning a day or two after the crisis of the first attack. In eight of these cases the relapse set in at the usual time, but it was neither very severe nor very prolonged. In four of the cases there was no relapse at all, while of fifty cases in which the salicylic treatment was not methodically employed only one escaped the relapse. In thirteen of the cases the relapse seemed to be delayed, shortened, and rendered less severe by the treatment; in

these cases the duration of the relapse varied from twelve hours to two and a half days, the temperature rarely exceeded $102\frac{1}{5}°$, and instead of showing itself on the seventh or eighth day after the first crisis, the relapse set in in six cases on the ninth day, in two on the tenth, in three on the eleventh, in one on the twelfth, and finally in one on the twenty-first day. It was noticed that in some of these cases, about the time the relapse was expected, the patients suffered for some days from malaise, headache, and loss of appetite, with rapid and shallow breathing, but without any elevation of temperature. This was particularly noticeable in one of the four cases that entirely escaped the relapse, and also in the case in which the relapse appeared on the twenty-first day; in this case the second attack of fever lasted only one day Finally, in one of the twenty-six cases, the temperature rose on the fifth day after the crisis, and the patient died on the same day with cerebral symptoms. The autopsy revealed the usual lesions of a recent relapsing fever, and the possibility of death from poisoning by the salicylate could be excluded. In all of these twenty-six cases the salicylate was well borne, in spite of the large doses, the only unpleasant symptom noticed being the usual tinnitus aurium. In one case the patient took an ounce of the drug in one day through a mistake, without any marked ill effects. The conclusion drawn by Dr. Riess from these observations is, that the salicylate of soda, when given in large doses for a sufficient number of days, will, in many cases, greatly lessen the duration and severity of the relapse in relapsing fever, and will, in some cases, entirely prevent it. He admits his inability to account for this power of the salicylate over relapsing fever. It is at least certain that the drug does not act by destroying the spirilla, as they were found in the blood during the salicylate-apyrexia. (*Deutsche Med. Wochen.*, No 52, 1879; *The New York Med. Record*, May 22, 1880.)

Contribution to the Local Treatment of Pulmonary Cavities.—Dr. Pepper read a paper before the American Medical Association in which he stated that the chief indications for the treatment of pulmonary cavities are, cleansing, disinfection, and modifying the walls of the cavity. The use of inhalations, sprays, and direct injections has been employed, but, as regards the first two measures, without much success. There is one form of inhalation by which some good may be accomplished. This is by the continuous inhalation of medicated vapour. An instrument for doing this was shown by the speaker. It consisted of a kind of mask, attached to which is a small box containing sponge on which the medicated fluid is poured. This is tied over the mouth. The best medicines are carbolic acid, iodine, thymol, etc. With an instrument of this kind the bad

breath due to putrid cavities, or bronchiectases, can be corrected, and probably good can be done in cases of chronic bronchitis.

It was not likely, however, that much could be done in pulmonary cavities by continual inhalation. The speaker, therefore, called attention to the value of direct injections into the lung cavities.

A number of cases were reported showing the value of this procedure. Lugol's solution, in the proportion of from ♏ x., ♏ xv. or ʒ i. to ℥ i. of water was used. In one case related the injections were given forty-eight times in fourteen months. The patient improved, and when he died some time afterward, from Bright's disease, the cavity was found to have been obliterated. Seventeen other cases were related or referred to, in which similar treatment was pursued, 291 injections having been made. Autopsies on some of the cases showed that contraction of the cavities was induced by the injections. Injections into caseous consolidation of the lung, in very bad cases, gave negative results.

The syringe used was like an ordinary hypodermic syringe, but had a larger barrel and longer needle. Lugol's solution and carbolic acid were the only agents suggested. The skin should be first chilled with ice; the injections should be mild at first. There is no danger in such injections, cough and pain being the only symptoms excited. (*The New York Med. Record*, June 3, 1880.)

Application for the Chronic Pains of Subacute Gout or Rheumatism.—Dr. Lenoble, of Esternay (Marne), has used the following unguent in a case of subacute gout; he has also found it useful in his own case when suffering on the eighth day from acute articular rheumatism:

℞ Finely powdered gamboge.
Myrrh.
Canella.
Salicylate of soda, āā 10 grams.
Essence of turpentine, q.s.

To be of a fluid consistency.

Three applications should be made daily by rubbing in the preparation briskly, and afterwards covering the affected joints with wadding. The same formula will serve neuralgia, recent or of old standing, after the first days of the acute attack have passed. (*Bouchut's Compend. de thérapeut. franç. et étrang*, 1880.)

On the Mechanism of the Striæ of Pregnancy.—Langer has studied the white glancing atrophic lines found not

to local treatment by means of chlorine lotions and isolation. The occasional occurrence of iritis, rupia, sore throat, and apparent rectal syphilis, were noted, and the paper closed with the following conclusions:

1. The initial lesion requires no mercury. 2 Syphilis, when iodine is used without mercury, is usually mild. 3. Syphilis, when treated with very small doses of iodide of mercury, is usually mild. 4. Iritis may supervene while patients are taking courses of mercury; but it is usually amenable to treatment by blisters and atropine 5. Tertiary syphilis is rare after iodide of potassium and iodide of mercury. 6. It is best treated by large doses of iodide of potassium, adding mercury when that remedy fails. 7. Cerebro-spinal syphilis supervenes in some cases early in the disease, and we may then give both specifics, or iodide of potassium alone. The same holds good in syphilis of the testis, liver, or lung 8. Mercury and iodine probably act by their power of destroying low vegetable organisms in the tissues—the yeast of syphilis (Hutchinson). 9. The dose of mercury ought to be very small. (*The New York Medical Record*, June 4, 1880.)

A Parasitic Fungus in Psoriasis. — Lang compares psoriasis with the dermatomycoses; and, after a short *résumé* of the clinical considerations favouring its identity with these, proceeds to give the results of his own investigations. These, he claims, show beyond all doubt that in certain portions of the psoriatic patch the elements of a fungus are present. In the delicate epidemic flakes which are close to the corium, and are exposed after the coarser silvery masses of the patch have been removed, may be seen under the microscope, along with the epidermic cells, débris, &c., the fungus. This, composed of spores and mycelium, is either scattered or aggregated. The spores are round or frequently oval, and measure from 0·006 mm. to 0·008 mm. in breadth, and in length sometimes twice as much; their protoplasm is very pale, and appears granular only under a high power. Nuclei are seldom present. The cell envelope is of a faint yellowish-green colour, and is thin, but double-contoured. Budding spores are frequently seen. The mycelial threads are from 0·002 to 0·004 mm. broad. In length they average 0·1 mm. The free ends of the hyphæ are usually rounded, or else have club-shaped enlargements. These often assume the appearance of pear-shaped spores attached at their smaller poles to the hyphæ, their cavities sometimes separated by septa Septa are likewise visible along the hyphæ. Lang was puzzled for some time by masses of oval or pear-shaped cells, connected together at their smaller ends by a tangle of very thin threads. Isolated specimens, however, enabled him to recognise these as transition

stages. Each of these stiff thin threads represented the remains of a hypha, deprived of its protoplasm, and shrunken into a thin fibre, maintaining, however, its continuity with the spore. Lang thinks the delicacy of structure and paleness of the protoplasm account for the previous ignorance of the fungus Once familiar with it, it can hardly fail to be found in any specimen. He considers this fungus to be quite unlike any form heretofore known as invading the human integument, and declares it to be as constant in psoriasis as trichophyton in tinea trichophytina He proposes to call it epidermidophyton. (*Vorläufige Mittheilung von einem neuen Untersuchungsergebnisse bei Psoriasis. Vierteljahr. f. Dermatol.* 1879, p. 257; *American Archives of Dermatology*, April, 1880.)

The Therapeutic Value of Iodide of Ethyl.—Dr. Lawrence states that the iodide of ethyl appears to act as an antispasmodic in the paroxysms of spasmodic asthma and in other forms of nervous dyspnœa. In the dyspnœa incident to bronchitis and to chronic affections of the air passages it promotes a free mucous secretion, its action being in such cases partly expectorant and thus resembling that of the alkalis. But since in bronchitic dyspnœa there exists usually, if not always, a reflex contraction of the bronchi, the antispasmodic quality of the drug is also of value. In general iodide of ethyl appears in some way or other to favour the oxygenation of the blood, and thus to stimulate in a reflex manner the respiratory muscles In conclusion Dr. Lawrence believes that the drug has a very positive therapeutic value, and is a prompt, safe, and efficient remedy in many forms of dyspnœa. The drug may be administered as follows. Having moistened a handkerchief with eight or ten drops, the patient may be directed to inhale the vapour therefrom As soon as he shall have acquired confidence, let the inhalations be made directly from a small vial, containing half a drachm of the drug, and applied to the nostrils. Let the inhalations be continued for ten minutes at a time, thrice daily, or oftener. Should slight nervous symptoms, due to the primary exhilarating effects of the ether, supervene, the inhalations may be discontinued for some seconds, and then resumed. By this method the system is kept constantly impregnated with iodine.

A very brief time is required for its absorption. The iodine is taken up by the respiratory mucous membrane, and is conveyed, by the bronchial and pulmonary veins, directly to the left auricle, and thence into the arterial circulation. It has been detected in the urine in ten minutes after the inhalations. The writer has found it in urine voided at the following intervals: forty-five minutes, one, seven, eighteen, twenty-four, thirty hours. (*The New York Medical Record*, June 19, 1880.)

Treatment of Pruritus Ani.—Dr. Packard has found the following ointment succeed in relieving obstinate cases of pruritus ani, in which the whole array of the ordinary remedies had failed :—

℞ Camphoræ.
Chloral. Hydrat. āā ℥ ss.
Ungt. Petrolei, ℥ vij
Sig. the ointment; apply frequently.

(*Med. and Surg. Reporter*, February 21, 1880.)

Therapeutic Effects of Chlorate of Potassium.—In a paper read before the Ulster Medical Society, Dr. Harkin states that he orders this drug as a saturated solution, *e.g.* one ounce of the salts to twenty of water, of which for adults one ounce three times daily, either before or after food, is the ordinary dose. Most useful by itself, its efficacy in arresting disease in chlorotic or hæmorrhagic diatheses may be greatly enhanced by the addition of iron in one of its many forms, the most convenient being tr. fer. perchlor. With the permanganate of potassium it forms a most excellent gargle and mixture in sore throats with diphtheritic exudation and for the healing of ulcers. It also forms a good base for many pectoral mixtures. Chlorate of potash in the form of a lotion is an excellent and rapidly-acting healing agent in injuries due to burns and scalds, even in those severe cases where the subcutaneous tissue is destroyed, and when ulceration is present after the separation of the eschars. In the treatment of caries of the vertebra of the neck by the injection of a solution of the salt, it has been employed in two cases with the greatest advantage; and in cases of strumous abscesses and sinuses treated by injection the cure is generally very rapid, the constitutional requirements being in every case attended to by the internal administration of the salt. The effect of chlorate of potassium upon ulcers, simple, irritable, indolent and rodent, is very remarkable. The hard and elevated edges of old ulcers rapidly give way to flattened and healthy ones, whilst the excavated sore is altered by the oxygenating power of the lotion, and is replaced by healthy granulations. (*The Dublin Journ. of Med. Sci.*, May, 1880.)

Gatti, Petersen, and others, on the Toxic Action of Salicylate of Soda.—This subject, though manifestly of extreme importance, has attracted comparatively little attention in England. On the Continent, however, several observers have lately recorded well-marked and unmistakable cases of subacute poisoning by salicylate of soda. Thus, in a record of 250 cases, Gatti (*Gazzetta degli Ospetali*, Feb. 29, 1880) witnessed unpleasant and even alarming symptoms in four. In one, the drug

administered in doses of twelve grains every four hours, during a period of ten hours, caused drowsiness, deafness, and complete amaurosis; in another, subacute delirium; in a third, severe gastralgia; and in a fourth, well-marked dyspnœa.—Petersen (*Deut. Med. Woch.* Nos. 2 & 3, 1877) mentions a case in which twenty-two grams administered in the space of six hours, induced disturbances both of respiration and circulation. But Gubler (*Journal de Pharmacie*, June, 1879) goes further than either of these observers, in his estimate of the toxic properties of both salicylic acid and its soda salt. According to him they at times produce effects not inferior to those of an irritant poison. Among such he enumerates severe colic, copious diarrhœa, cyanosis, and collapse, with eventually ulceration of portions of the digestive tract. On the other hand, a long array of names may be quoted in support of conclusions diametrically opposed to those of Petersen and Gubler. In this case, however, negative evidence is of comparatively little importance. The question at issue is not the possibility, but rather the frequency, or otherwise, of salicylic intoxication. Of the fact of such having occurred, there is unfortunately no room for doubt; both clinical observation and physiological experiments having thoroughly established it. Chirone and Petrucci (*Commentario Clinico di Pisa*, January and February, 1878) have demonstrated that salicylate of soda administered to animals first increases and then diminishes the frequency of the respirations; while Bass and Kœler have shown that dogs and rabbits poisoned by it have died with the symptoms, and *post-mortem* signs of asphyxia. Considering the very extensive use of salicylate of soda as a therapeutic agent, it is important to have some ready means of watching its action on the system. Administered in medicinal doses, it can generally be readily detected in the urine within two hours of its ingestion. The best and most sensitive test of its presence is a few drops of perchloride of iron added to the urine in a test-tube. If salicylic acid be present, a bright violet colour, due to the formation of salicyluric acid, will be at once struck. This reaction is extremely delicate, and may be relied on, if one part in a million of the acid exists in the sample of urine. It being well known that almost if not all the acid ingested is eliminated by the kidneys, its presence will be more or less satisfactory proof that these organs are physiologically sound. Should it not appear, however, it is evidently either accumulating in the system, or is undergoing some abnormal decomposition by which its chemical characteristics are being essentially altered. Seeing, therefore, that the toxic effects of salicylate of soda may manifest themselves at any moment, and in any case, some general rules as regards its administration seem to be called for. Judging from their known physiological action, all salicylates should be

given with considerable caution, in cases either of phthisis or of renal disease. Their employment should at once he stopped, or at least very carefully watched, whenever the characteristic appearances in the urine cannot readily be detected within two hours after ingestion of the medicine. The possibility of idiosyncrasy in certain individuals should always be borne in mind, together with the fact that salicylic acid itself is not unfrequently adulterated with carbolic acid. The importance of this latter fact is self-evident. After all, however, very little is as yet accurately known as regards the indications either for or against the use of salicylic acid and its salts. In such circumstances, therefore, the practitioner can do little more than study carefully and intelligently each case on its own merits, bearing in mind that, so far as at present observed, all untoward symptoms have quickly passed off, without having left any permanent ill-effects. (*London Medical Record*, May 15, 1880.)

The Physiological and Therapeutic Properties of the Alkalies of Pomegranate.—M. Dujardin-Beaumetz read a paper before the French Academy of Medicine upon this subject, in which he arrived at the following conclusions:—(1) The alkalies of the pomegranate possess actual and energetic physiological properties. (2) They produce paralysis of the motor nerves whilst they leave uninjured the muscular contractility; sensation is unimpaired, and they appear to act instantaneously upon the muscle plates of the motor nerves; they are therefore poisons acting like urari. (3) Sulphates of pelletierin and isopelletierin possess energetic tæniacide properties when exhibited in doses of 0·30 gram in a solution containing 0 50 of tannin; since, in the majority of cases (37 times out of 39, according to Dujardin-Beaumetz, and 19 times out of 19, according to Laboulbène), they cause the expulsion of the parasite with its head. (4) Fresh observations are required to determine the effects of these physiological properties in the cure of certain diseases: in the first place, it should be employed in those cases in which urari has been recommended (tetanus and hydrophobia); secondly, in those affections of the eye in which it is necessary to excite a marked congestion of the fundus; and lastly, in certain cases of vertigo, especially in Menière's disease. (*Le Progrès médical*, May 22, 1880.)

Nutrient Peptone Enema.—M. Bagros has made enemata according to the following formula for administration in cases where the patient refused to take food:—

Lean beef, 150 grams.
Boudault's acidulated pepsin, 4 grams.
Pure glycerin, 20 grams.
Tepid water, 80 grams.

The meat to be reduced to a pulp in a marble mortar, the pepsin, glycerin, and water to be added successively. The mixture to be then placed in a wide-mouthed flask and to be kept at a constant temperature of 40° to 45° C. At the end of five or six hours the rose colour which the mixture first had will have become replaced by grey. Filter under pressure; eight to ten grains of residue should remain on the filter, whilst the filtrate is an opaque greyish and nearly odourless liquid. The addition of glycerin at the beginning of the operation is necessary to prevent the mixture acquiring a disagreeable odour, whilst it does not in any way destroy the solvent power of the pepsin. The preparation thus made keeps well: thus two samples were preserved for more than four months in partially filled flasks, and although they were repeatedly opened and examined they were always found to be in the same condition as on the first day The patient for whom these enemata were made had reduced himself to live on one or two figs and a few dried raisins a day, yet he was in the habit of taking exercise. For a month an enema was given every morning, and its use was only discontinued when the patient again commenced to take food, and there is every reason to suppose that it assisted materially in conserving his energies. (*Le Progrès médical*, June 12, 1880.)

Nerve Deafness.—In regard to the *treatment of nerve deafness*, Lucie (Berlin) has obtained brilliant results in some few cases of pulsating subjective noises by the use of hydrobromic acid as recommended by Woakes, 15·20 drops being given three times a day in syrup. (*Ibid.*)

Oxalic Acid in Diphtheria—During the winter of 1877-78 the town of St. Georges-sur-Loire was visited by so severe an epidemic of diphtheria that it was decided, as a prophylactic measure, to close the church and school house. Dr. Cornilleau learnt that at this time a woman was employing under the title of the "grand cure," an empirical treatment, from which she obtained excellent results. Two bottles of the vaunted specific were therefore procured, and were shown by analysis to consist of oxalic acid in combination with potash and traces of tannin. In place of the ordinary methods of treatment, which had so often failed, Dr. Cornilleau did not hesitate to adopt this plan, and for this purpose used the following formula:—

Pure oxalic acid, 1 gr 50.
Infusion of green tea, 120 grams.
Syrup of bitter orange peel, 30 grams.

A dessert spoonful to be taken every three hours.

Or a decoction prepared from fresh sorrel-leaves, 150 grams. and boiling water, 1,000 grams, may be taken hourly to the extent of a basin or teacupful, or a smaller quantity, according to the age of the patient. It is easy to sweeten this decoction at the time of administration. Preserved sorrel leaves may be used when the fresh ones cannot be obtained. On the third day of the treatment a marked improvement occurs in the general condition; the false membranes lessen both in extent and in thickness; and convalescence may occur at the end of the first week. Sanitary precautions should at the same time be taken, a strengthening diet must be given, the patient should take milk, beef tea, wine, coffee, underdone meat, &c. By these means the author has successfully treated 17 out of 18 cases. (*Le Progrès médical*, May 8, 1880.)

On the Quantitative Determination of the Perception of Light in Cataract.—Trompetter believes that the usual method of determining the perception of light in cataract is not sufficiently delicate for the diagnosis of complications affecting vision in the deeper structures of the eye. According to Graefe, if a patient with mature cataract can distinguish the flame of a candle at the distance of fifteen feet, the existence of any serious complication may be excluded Two points seemed to the author to claim further attention. *Firstly*, how to express numerically, in the simplest and most accurate manner, the amount of light-perception in any case; and *secondly*, what degree of perception would lead one to diagnose complication. Forster's photometer was found to be the most convenient method of regulating the intensity of the light used. The smallest opening in the diaphragm, which permits of the transmission of an amount of light, which the patient is just able to distinguish from darkness, is taken as the measure of the light-perception. For uncomplicated cataracts this varied from 12·5 to 32 sq. mm., being less if the eye remained for fifteen minutes previous to examination in the dark. A cataractous eye, receiving no sensation of light from an aperture of 32 sq. mm. in the photometer, must be looked upon as presenting some additional pathological condition. We see no reason, however, for departing from the usual method of examination, provided due attention be paid to the state of the projection. (*Klinische Monatsblätter f. Augenheik*, March, 1880; *Edinburgh Medical Journal*, May, 1880.)

Alterations in the Alimentary Tract in Pulmonary Consumption.—Mazotti states that in fifty necropsies performed on patients who had died of pulmonary consumption he found lesions of the alimentary tract in thirty-eight; in the remaining twelve no such lesions were present. In thirty-seven

of the cases so affected the lesions consisted of ulcers situated either on the tongue, pharynx, stomach, or large or small intestines, but not in the œsophagus or rectum. In all cases, with one exception, the lesions were multiple ulceration of the tongue, pharynx, or stomach, existing simultaneously with ulceration of the intestines. In twelve cases the lesions were confined to the small intestine, in five to the large, while in twenty they affected both viscera. The author observes that in cases where ulceration has been confined to the small intestines the colon frequently contained solid fæcal matter, thereby demonstrating a fact already remarked on by Niemeyer, that ulceration of the small intestines may exist without giving rise to diarrhœa. As a rule the number and extent of the intestinal ulcerations bore a constant relation to the pulmonary lesions. In the small intestines, the ulcers were generally seated in the lower portion of the ileum, although in some cases they were confined to the ileo-cæcal valve, while in others they extended as high as the jejunum, and even to the duodenum. These ulcers in the earliest stage appeared as small, white spherical bodies, of the size of a pin's head, springing from the mucous membrane. At a later stage they became larger, and the mucous membrane had shrunk away from their summits, thus leaving punctiform ulcers. In some cases the ulcers were situated on Peyer's patches and more multiple. In the large intestine, the lesions were as a rule confined to the ascending colon, though, where numerous, they were also found in the cæcum and around the vermiform appendix. The author remarks on the extreme rarity of tubercle or granulations in the large intestine as compared with the small. The article extends to a considerable length, an analysis of each case being given and ample references being made to the literature of the subject. (*The London Medical Record*, April, 1880; *Bulletino delle Scienze Mediche*, Jan. 1880.)

Notes and Queries.

HARZER WATER.—In its composition, this water much resembles other effervescing table waters, being slightly saline, and containing a small quantity of alkaline bicarbonate, with much free carbonic acid. It is very pleasant to drink, and mixes well with spirits, forming an excellent and agreeable table water.

HEWLETT'S MIST. PEPSINÆ CO. C BISMUTHO.—This mixture contains pepsine, bismuth, opium, hydrocyanic acid, and nux vomica. It is an elegant preparation, and mixes freely with water, giving no precipitate. In cases of pyrosis, carcinoma of the stomach, and irritable dyspepsia, the preparation affords a convenient and pleasant way of administering sedatives.

MACKEY'S THEOBROMOLINE, OR TASTELESS CHOCOLATED COD LIVER OIL.—In this preparation the fishy taste of the oil is very efficiently covered by admixture with chocolate and some aromatics; and it will not only be very suitable for invalids who cannot take pure cod-liver oil, but will be sought after by children as a sweetmeat, and the administration of the cod-liver oil to them in this form will give pleasure to the child and save trouble to the parents.

GALE'S HYPOPHOSPHINE.—This is a mixture prepared by Messrs. Gale & Co., containing cod-liver oil, with the hypophosphites of iron, lime, soda, and magnesia. The whole is made up into an emulsion by no means unpleasant to take. The combination of two such useful remedies promises to be very serviceable in phthisis and in all wasting diseases attended with nervous debility.

ALLEN AND HANBURY'S PASTILLES.—The utility of local application of remedies to the throat in cases of cough has long been recognised, and in the British Pharmacopœia we have several lozenges for this purpose. But not unfrequently jujubes

are found to be even better than lozenges, and Messrs. Allen & Hanbury have prepared a number of pastilles or medicated jujubes containing various drugs which are useful in cartarrh of the respiratory passages and in allaying cough generally. We have pastilli morphiæ et ipecac, morph. et ipecac. comp. morphiæ et atropiæ, opii et belladonnæ, ipecacuanhæ, camph. comp, acidi benzoici, sodæ chloratis, lithiæ, aconiti. These pastilles are pleasant to look at, and agreeable to the taste. They melt away slowly in the mouth, and form most agreeable media for the administration of the drugs which they respectively contain.

NITRO-GLYCERINE PILLS—We have received from Messrs. Parke, Davis, & Co., of Detroit, Michigan, some specimens of sugar-coated nitro-glycerine pills Each pill contains $\frac{1}{50}$ of a grain of nitro-glycerine. They are very small, and easily swallowed, and afford a pleasant and ready means of administering this remedy, which is now becoming so useful in angina pectoris and asthma.

FLETCHER'S SOLID FLAME BURNER.—This burner supplies a want long felt in sick-room cookery. It cannot be spoiled by accident, is free from smell, and will boil an egg, cook a chop, or bake a round of beef in a sheet-iron oven if required. In six minutes it will boil a quart of water in a flat copper kettle, and will thus be of great service in heating water rapidly when it is wished for on an emergency, as, for example, in making poultices or fomentations for the relief of sudden pain. It will, we think, be invaluable in the sick-room, and the only objection that we can see to it is that it may be somewhat difficult to make the flame sufficiently small to keep milk or beef tea put in the vessel over it at the temperature of the body, and prevent it from becoming too hot. Perhaps, however, a little care in the adjustment of the flame may be sufficient to secure even this, and then the apparatus will be well nigh perfect.

Bibliography.

Zur Aetiologie der Infectionskrankheiten m. besond. Berücksicht der Pilztheorie. Vortrage geh. in den Sitzgn. d. Aertzl. Vereins zu München. 1 Halfte. 8vo. München: J. A. Finsterlin.

Ueber spinale Myosis u. reflectorische Pupillenstarre. Von Wilh. Erb. 4to. pp. 16. Leipzig: Edelmann.

Vorträge üb. Canalisation u. Abfuhr. Von Prof. Max v. Pettenkofer. 8vo. pp. 149. München: J. A. Finsterlin.

Vorlesungen üb. allgemeine Pathologie. Von Prof. Jul. Cohnheim. 2 Bd. 8vo pp. 582. Berlin: Hirschwald.

Diseases and Injuries of the Eye, their Medical and Surgical Treatment. By George Lawson, F.R.C.S., etc. 4th edition. 8vo. pp. 420. London: Henry Renshaw. 10*s.* 6*d.*

Lectures on the Human Eye in its Normal and Pathological Conditions. By Adolf Alt, M.D. 8vo. pp. 208. New York: G. P. Putman's Sons.

Lectures on Rest and Pain. By the late John Hilton, F.R.S., etc. Edited by W. H. A. Jacobson, B.A., M.B., F.R.C.S. 3rd edition. 8vo. pp. 511. London: George Bell and Sons.

The Physiological and Pathological Relations of the Voice and Speech. By John Syer Bristowe, M.D., F.R.C.P. 8vo. pp. 147. London: David Bogue.

The Function of Vision and its Anomalies. By Dr. Giraud-Teulon. Translated by Lloyd Owen, F.R.C.S.I. 8vo. pp. 158. London: Baillière, Tindall, and Cox.

Materia Medica, Pharmacology, and Therapeutics. By R. E. Scoresby-Jackson, M.D., F.R.S.E., &c., &c. 4th edition. Revised by Dr. Francis W. Moinet, F.R.S.E. 8vo. pp. 470. Edinburgh: Machlachlan and Stewart.

Diagnosis of Diseases of the Spinal Cord. By W. R. Gowers, M.D., F.R.C.P. 8vo. pp. 80. London: Churchill.

A Guide to the Practical Examination of Urine. By James Tyson, M.D. 8vo. pp. 183. Philadelphia: Lindsay and Blakiston

Insufficiency of the Aortic Valves in Connection with Sudden Death. By John Cockle, A.M., M.D. 8vo. pp. 64. London: Baillière, Tindall, and Cox

Tables of the Physiological Action of Drugs. By E. A. Morshead, M.R.C.S. 8vo. pp. 16. London. H. K. Lewis.

Pyrexin or Pyrogen as a Therapeutic Agent. By John Drysdale, M.D. 8vo. pp. 16. London: Baillière, Tindall, and Cox.

The Elements of Indian Hygiene. By John C. Lucas, F.R.C.S., H.M. Indian Med. Service. Crown 8vo. pp. 112. 5*s* London: Churchill.

Introduction to the Study of Chemistry. By A. P. Luff, F.I.C. &c Crown 8vo. pp. 79. 2*s.* 6*d.* London: Churchill.

Healthy Life and Healthy Dwellings. By Geo. Wilson, M.A., M.D. Fcap. 8vo. pp. 302. 5*s.* London: Churchill.

Potable Water. By Chas. Ekin, F.C.S. Crown 8vo. pp. 25. 2*s.* London: Churchill.

On Atrophy of the Stomach. By Samuel Fenwick, M.D. 8vo. pp. 187. 8*s.* London: Churchill.

On Removal of the Entire Tongue. By Edward Lund, F.R.C.S. 8vo. pp. 36. 2*s.* London: Churchill.

Ophthalmic Hospital Reports, part i. vol. x. By John Tweedy, F.R.C.S 8vo pp. 138, with plates. 6*s.* London: Churchill.

The Baths and Mineral Waters of Bath. By R. W. Falconer, M.D. Fcap. 8vo. pp. 56, with plates. 1*s.* 6*d.* London: Churchill.

Palliative Medicine and Palliative Treatment in Surgical Cases. By Edward Lund, F.R.C.S. 8vo. pp. 26. 6*d.* London: Churchill.

The Ocean as a Health-Resort. By W. S. Wilson, L.R.C.P. Crown 8vo. pp. 260. 7*s.* 6*d.* London: Churchill.

*** Any of the foreign works may be procured on application to Messrs. DULAU, of Soho Square, W.C.; WILLIAMS and NORGATE, of Henrietta Street, Covent Garden, W.C.; or BAILLIÈRE, of King William Street, Charing Cross.

OBSERVATIONS ON CERTAIN QUESTIONS IN EPIDEMIOLOGY.

BY SURGEON-GENERAL SIR JOSEPH FAYRER, K.C S I, M.D, F.R.S., &c.

President of the Epidemiological Society.

FROM AN ADDRESS DELIVERED AT THE OPENING OF THE 31ST SESSION OF THE EPIDEMIOLOGICAL SOCIETY OF LONDON, NOVEMBER 3RD, 1880)

[AFTER describing the present condition of the Epidemiological Society, its prosperity and progress, and the losses it had sustained by deaths among its members, Sir Joseph Fayrer proceeded.]

I now turn to a brief retrospect of the subjects that have occupied us during the last session. They have all been important, whilst the discussions on them have been most interesting, especially those on Indian fevers; and I trust they may have the effect of drawing attention to the importance of reconsidering the question, especially as respects the etiology of those forms which, while presenting the phenomena of the enteric fevers of Europe, are by some considered to be due to general, rather than to specific, causes. I will briefly refer to the papers that have been read during the past year. Three important contributions on plague have been made; the first was by Dr. Payne, one of the two commissioners appointed by Government in 1879 to investigate the plague which had been prevailing on the banks of the Volga in the province of Astrakan in 1878-79 This interesting communication threw much light on the geographical distribution, history, progress and diffusion of the disease, which the commissioners consider was Levantine plague; and on the measures taken by the Russian Government for its suppression. They consider that there is no evidence to support the theory

that it was introduced by Cossacks returning from the war in Asia, or that it was directly transferred from Resht or elsewhere on the Caspian Sea to Vetlanka, but that everything pointed to the conclusion that the disease had already gained a footing in the district (whether introduced from outside or springing up spontaneously in its soil) before the outbreak at Vetlanka. Dr. Payne remarks, that with regard to the possible spontaneous origin, "It appears that the same reasons which will hold to show that plague is endemic, or springs up without being introduced from elsewhere in other parts of the world, seem to apply here. Actual proof of such an origin would be almost in any case unattainable, but the difficulties which beset all theories accounting for its introduction into the district certainly argue strongly in favour of such a view." With regard to the nature of the epidemic; its character, and its morbid anatomy, the wide spread of the disease with special reference to personal communication and the influence of local causes and contagion, the commissioners had no opportunity of forming any opinion from personal observations, as the disease had died out before their arrival. The information they obtained from those examined on the spot is all they had on which to form conclusions on these subjects; and it is to be regretted that, on matters about which wide differences have been expressed, the opportunity had not been afforded to such highly qualified observers of making personal investigation.

An interesting summary of the German Medical Commissioners' report on the same subject was read by Mr. Lawrence Hamilton. Dr. A. Hirsch, of Berlin, whose account of the plague in Astrakan differs considerably from that of Drs. Payne and Colvill, describes it as a malignant contagious disease with all the characters of Oriental plague, sometimes with buboes, sometimes without them. He and his German colleagues attribute the outbreak to the importation of infected articles from the Asiatic seat of the Russo-Turkish war, and that it was not imported from Resht; neither is it indigenous to Astrakan, where it had not appeared since 1808. Thus a further proof is afforded of the difficulty of tracing out the origin of this disease. The report shows further that, owing to faulty and imperfect reports of the disease in Vetlanka, the Russian Government could not,

or did not, avail itself of preventive or precautionary measures until the plague had attained its maximum intensity, and was already approaching its natural termination. The paper was an interesting summary of the report, and showed that considerable difference of opinion exists on the subject of the etiology and mode of propagation of the disease.

Another interesting communication was by Surgeon-General Dr. Francis on the subject of plague in India. He pointed out the geographical distribution of the disease in Kumaon and Gurhwal, to which it is at present confined, and where it is known as Mahamurrie, and describes the characters and habits of the people of those districts, which are all conducive to the development of the disease. Known since 1823, but probably existing long before that period, it has been characterised by glandular swellings, hæmorrhages, and rapid death. It is endemic bubonic plague, caused by an animal poison which is generated by the operation of local conditions, and is in no way modified by malaria. Intensely contagious among the people themselves, the pilgrims and visitors who visit the shrines in that country and those who carry merchandise to Tibet, appear not to suffer. Europeans also escape. The Pali plague, a disease having much the same character, which was first known in the west of India in 1818, seems to be closely allied to the Mahamurrie, by which it has been, as it were, replaced, especially when insanitary conditions prevail, as they are so prone to do among these hill people who claim a Rajpoot descent. It seems as though some common factors were at work leading to the development of epidemic disease, each *sui generis* being brought out under the influence of certain local conditions. It is possible that the disease may have been imported through the medium of the cotton workers, who may have received it through importation from Egypt, *viâ* Surat, in goods; but Dr. Francis is of opinion that the local conditions were sufficient to give rise to it, and that no assistance from without was needed. He attaches much importance to sanitary measures, and considers that it has been satisfactorily proved in the case of Mahamurrie that sanitary reform rigidly enforced was efficacious in preventing it.

These communications, though of considerable interest as contributions to the literature of the subject, do not add very

materially to our knowledge on the important question of contagion and mode of diffusion and propagation. Let us hope that at no remote period it will again be brought under consideration.

Dr. Longstaff read a paper on the relationship between scarlatina, puerperal fever, erysipelas, and certain other diseases, in which he deduced from the comparative death-rate curves and their annual fluctuations that the different causes of death should be classified into the diarrhœal group relating to the heat of summer; the bronchitic, to the cold of winter; the scarlatinal group, and a provisional group comprising all the other causes of death not known to be much influenced by meteorological conditions. All this was represented in elaborate diagrams and curves. One object of the paper was to suggest the probability that the poisons of erysipelas and puerperal fever were identical, while diphtheria and croup were also due to but one poison, and to discourage the multiplication of species in the classification of disease. The paper was a valuable contribution to statistical medicine—a mode of studying disease which, pursued on an extended scale, enables the inquirer to arrive by the numerical method at the nature of the laws which regulate and govern the origin and diffusion of the disease.

Cholera has not attracted so much of your attention as in former sessions, but it has not been overlooked, and a most practical paper by your late president, who has probably seen more of the disease than almost any living physician, occupied attention and discussion during the greater part of one meeting.

Dr. Murray prepared a most elaborate set of statistical tables showing the prevalence of cholera in India since the early part of the century, and in his observations on these tables pointed out the great value of removal of troops or prisoners to other localities on the breaking out of the disease, and that the objections that have been urged against it on the score of expense and the risks arising from exposure to sunstroke, fever, &c., were not such as should forbid the change, which experience has shown to be attended with the best results—an argument that could be endorsed by many medical officers. The measure recommended by Dr. Murray, which was much like that officially promulgated in 1870 by the Government, comprised, along with change, the observance of all sanitary and hygienic

details with strict attention, and enforced the selection of high well-drained ground on the other bank of a river, if possible, especially should the site infected be near a stream. Dr. Murray's experience and the constant care with which he has studied cholera in every phase and from every aspect, made the paper one of much practical value, and naturally elicited a considerable amount of discussion on a subject that he has made peculiarly his own.

Surgeon-General J. T. C. Ross, C.I.E., who went to Africa as Chief Commissioner of the Stafford House Committee for the relief of the sick and wounded in the Zulu war, read a paper on epidemic diseases in man and animals in the colony of Natal. He pointed out that, although the climate had proved healthy for human beings, it had been unfavourable for cattle; and made some remarks on the prevailing forms of disease. Cholera is unknown hitherto; small-pox exceedingly rare. Typhoid was the principal disease that affected the troops during the campaign in Zululand, and Mr. Ross says the disease affecting the troops shut up in Ekowe was called typho-malarial fever, with rose-coloured spots and affection of Peyer's glands. The diseases affecting the lower animals were those allied to anthrax, diarrhœa, pleuro-pneumonia, and hæmo-albuminuria. Defective food and water are regarded as instrumental in causing much of the disease. The paper was all the more interesting that it was the result of very recent personal observation by an officer of large and varied experience.

The subject that has most engaged the attention of the Society has been that of certain forms of fever in India and tropical and subtropical climates, and several important communications on this subject have been made by men of large and varied experience Dr. Chevers on relapsing fever; Dr. Ewart on enteric fever; Dr. Don on the continued fever of subtropical climates; and Dr. C. A Gordon on the continued fever of India, have most clearly placed their views before the Society, and have plainly shown that the subject still needs much investigation; and that, however strictly certain views of the etiology of these diseases may be applicable in Europe, a wider scope must be given to the inquiry in reference to causation in other parts of the world lying nearer the equator. Dr. Chevers traced the

history, origin, and the gradual extension of relapsing fever in different parts of India, and its appearance in the form of a distinctive fever in the Indian jails, its relation to other diseases, and its affinities with the so-called famine fever of Europe. The subject had also been reported on by Drs. V. Carter, W. G. Hunter, and Cunningham, and the relation of the spirillum as a cause had been discussed by these officers; the result being to show, that while some authorities regarded the organism as the cause, others looked on it as merely an epiphenomenon, devoid of all causal relation to the disease. Dr. Chevers pointed out that though the disease has not appeared in Lower Bengal of late years, that country was subject to its ravages up to and beyond the end of the last century, and that it has appeared among the poor and half-starved inhabitants of certain districts and in the jails. It has been considered by some that the outbreak of relapsing fever which appeared in Bombay in 1877 was not really referable to the famine that affected large areas of Southern India. The etiology of this form of fever, its relation to the effects of famine and to the spirillum, are still therefore *sub justice.*

It is to be hoped that further research will produce reports that may give more light. The chief interest of the proceedings of the year may be said to have centred in the discussion arising out of the communications by Drs Ewart, Don, and C. A. Gordon in respect of enteric fever. The subject has attracted a good deal of attention lately, in reference especially to the health of the European troops serving in India and tropical climates. It is only recently, indeed, that the disease has been recognised as a cause of mortality in India, and now it appears from official reports that the death-rate from this disease among our European soldiers, especially the young ones, is very high. The question, therefore, that has been so earnestly discussed is this—are all the cases returned as enteric fever, in which the symptoms and phenomena in life and the post-mortem appearances are similar to those of enteric fever in this country, due to the same causes? that is, are they the result of the contagion of a specific poison generated in the intestine or its contents of one person, and conveyed to another through the intervention of air, water, or other medium? or are they not in some cases—perhaps a large proportion—due to causes of a

different nature, referable to what are known as climatic influences, by which is meant heat, moisture, malaria, miasmata, or water in which there are dissolved or suspended, with perchance the addition of other causes, aerial-telluric, of which we know nothing positively, but of whose existence, as dynamic agencies, we probably have indications in other epidemic diseases? As to the existence in India and other tropical countries of a form of fever characterised by certain phenomena and pathological changes very closely, if not exactly, resembling those that characterise the enteric fever of Stewart, Budd, Jenner, and Murchison, there is a pretty general consensus of opinion; and few who have practised long in India, or the tropic or subtropical regions, but have seen and treated cases, that in all their symptoms and conditions were like the cases of typhoid they had seen at home. But on the question of causation there can be no doubt, as is evident from the papers referred to, that a considerable divergence of opinion exists, and, so far as I can make out from communications that I have seen or received from different parts of the world, it is a growing belief that the cause of some of the cases of the so-called enteric fever is to be sought in high temperature, malaria, miasmata, water contaminated by organic matter (not only fæcal), rather than in specific poison generated in the intestine or in the alvine discharges after extrusion from the bowels; and perhaps in some state of body, especially in the young, that is induced by exposure to one or all of these influences, whereby the poison or cause of the fever is elaborated in the body itself. It cannot, I think, be disputed, that the poison of the enteric contagion theory advocated by the high authority already referred to, must be equally effective in producing fever wherever it occurs, and certainly not less so in India or the tropics than elsewhere. Few, I think, question its potency here now, though—if I may be pardoned for saying so—I think it is *possible* that, twenty years hence, even here this view may be somewhat modified. But, as I have said, some, and they are not inexperienced, are impressed with the belief that the specific contagion theory will not explain the facts in all cases abroad, nor do they see reason to think that a certain train of symptoms and phenomena during life, and lesions observed after death, must necessarily be *invariably* due to *one* single cause; but rather that the bowel

ulceration, diarrhœa, spots, and a certain range of febrile disturbance in the temperature, and so on, may be brought about also by other conditions, such as those already referred to, and which make up what is known as climatic influences. It is after all a matter of speculation, and, to a certain extent, of evidence, for even in the most indisputable outbreaks of typhoid fever, wherever it may occur, the specific poison has never yet been seen or separated—not that this is necessarily a reason for denying either its potency or the probability of its existence on the one hand, but that on the other it seems equally reasonable to admit the possible efficiency of other causes.

For my own part, whilst fully admitting that enteric fever in India and the tropics may originate as it does here, I cannot resist the impression that other causes may be at work, and that cases of fever which in India are not only called enteric, but present the phenomena in life and the changes after death that are characteristic of the disease in England, do occur, and not unfrequently, where it is more probable that climatic and other local conditions are the cause, than fæcal contagion, though it must be admitted that the possibility of fæcal origin where human beings have been cannot be denied. But I have no desire to dogmatise, and I await further investigations and reports before I convince myself or assert to others that to be a fact which at present is only an impression, though so strong as almost to amount to a conviction. It is a subject of considerable importance, and may well stimulate further inquiry, as there is reason to believe that it will, indeed has already begun to, receive, and nowhere with more interest than in this Society. I may not detain you to epitomise the three important papers, but would briefly say that in them the subject has been ventilated and discussed by men of large experience, who have had ample opportunity of forming opinions from *personal* observation; and the very fact that such observers differ in their views as to the etiology of this fever proves to my mind that there is good reason to think that the whole subject of the etiology of Indian fevers does need further consideration. Nor is this a matter of mere pathological or nosological interest, important as that aspect of the question may be, for it involves grave questions of sanitation, or it may be the expenditure of large sums of money in regard to the methods of dealing with the health of the

European soldier or others generally in these countries, as well as the treatment. It is obvious that it is very important to work out the causes and deal with them accordingly, and this I trust the discussions of our Society will in some measure tend to effect.

[Sir Joseph Fayrer's observations on the losses sustained by death will be read with interest.]

The past year told heavily on most of our scientific societies, and many an honoured name has disappeared from their rolls, but I doubt if any have suffered in proportion to their numbers so much as we have, in the loss of Dr. E. C. Seaton, Mr Harry Leach, and Dr. E Goodeve. Dr. Edward Cator Seaton was one of the founders and Presidents of our Society, and it was during his early connection with it that he commenced the researches into the subject of vaccination and small-pox which are embodied in his valuable reports, and ultimately led to that important measure, the Compulsory Vaccination Act of 1853. It is in connection with this that his name has attained a wide reputation, for certainly no one has done more towards promoting the diffusion of Jenner's great discovery, and in systematizing the methods by which it has been so largely extended to the people. His writings on vaccination and small-pox are well known as authoritative works on the subject, in regard to which his name will stand on record as that of a public benefactor. Dr. Seaton's public services were not confined to his efforts in respect of vaccination; as an inspector, under the Privy Council and Local Government Board, he was much interested in, and actively concerned himself with, other sanitary subjects; and his selection as the British representative at the International Sanitary Conference held at Vienna in 1874, of which he made a valuable report, bears witness to the esteem in which he was held as a sanitary authority. In 1876 he succeeded Mr. Simon, C.B., as medical officer to the Local Government Board, to which he had previously been assistant medical officer. His extensive knowledge of sanitary science, his administrative capacity and sound judgment, made him a peculiarly fitting successor to his distinguished predecessor. Dr. Seaton enjoyed good health until a year or so after he became medical officer to the Board of Health, when signs of impairment appeared. The duties, which were very arduous, had severely taxed his strength, but he

continued to perform them for a year longer, when his medical adviser deemed it expedient to enjoin rest and change, which advice he prepared to follow. About this time a severe domestic affliction made a deep and profound impression on him, and must have aggravated the depression of his general health. He returned to work, however, in June, feeling anxious to resume his duties, in which he might find that solace which perhaps is the best remedy for such a sorrow. Some improvement in his health followed, but it was only transient, for in the following October, when on a visit in Warwickshire, he was seized with an attack of hemiplegia, from which he partially recovered, and hopes were entertained that his valuable life would be prolonged; but they proved illusory, for he sank under a second attack on the 21st of January, 1880, in the sixty-fourth year of his age, deeply lamented by his family and by a large circle of friends. I had only recently made his acquaintance, but was, as others must have been, much attracted by his gentle and courteous manner and bearing; and felt that in him we lost a sterling friend, the public a learned physician and sanatarian, and the Government a valuable public officer,—would that I could have added that the public recognition to which his services eminently entitled him had been accorded. His valuable life closed too soon, but not too soon to have left an example which those who follow in the walk of life to which he devoted himself, may feel pride in attempting to imitate.

It is also my duty to record the death of another distinguished member of the Society, Mr. Harry Leach, who died at the early age of forty-three, after a brief but brilliant career, which was largely devoted to the advancement of public-health interests in the duties of the important office of health officer for the port of London, a post of which he was the first incumbent, and which was founded most probably as the result of his own efforts during the cholera invasion of 1866, when he was most active, as a medical officer of the *Dreadnought*, in instituting a thorough examination of all ships that came into the river from suspected ports, and in devising measures for the relief and sequestration of those who were attacked with the disease. He was enthusiastic in the pursuit of professional knowledge, and of all that threw light on the subject he had so much at heart; whilst his acquaintance with disease appears to have been sound and

extensive. To his efforts and representations the merchant navy are largely indebted for measures that have tended materially to diminish scurvy, and they received their reward in the success that resulted from them, and in the passing of the Amended Merchant Seaman's Act, especially in regard to the use of antiscorbutics. In his anxiety to benefit others, he took too little heed of his own health, and the fogs and damps of the river to which he was much exposed in the performance of his duties contributed to develop disease in lungs originally delicate. A voyage to Natal produced some improvement, but of brief duration, for he succumbed on the 26th of November, 1879, to the great regret of all who knew him.

Since writing the above, intelligence has reached us of the death of Deputy Inspector-General E. Goodeve, M.D., Honorary Physician to the Queen, at Stoke Bishop, in the sixty-fourth year of his age. He had for some time been in failing health, from some obscure form of cerebral disease, and the end came rather suddenly on the 27th of last month He was at one time an active member of our Society, and took a prominent part in the discussions. His last public service was as British representative at the Cholera Conference at Constantinople in 1866. His knowledge of disease was profound, and his contributions on cholera, diarrhœa, enteric fever in India, and the so-called "red fever" of Bengal, were most valuable. His service in India commenced in 1841, and his whole career, whether in the field during the Sutlej campaign, in the large civil station of Cawnpore, where he acquired great experience, or during his long connection with the Medical College and hospital in Calcutta as Professor of Medicine and senior physician, president of the Faculty of Medicine and examiner in medicine of the Calcutta University, was most distinguished. He rapidly attained the highest honours and position as a physician and a teacher, whilst his retiring, unselfish, straightforward and noble character endeared him to all who knew him.

The medical officers of India have not been among the least of her benefactors; and none, assuredly, ever did more to deserve that epithet than Edward Goodeve. His death will be deeply lamented, and his memory fondly cherished by his service, and by natives and Europeans alike in India.

INDEX.

INDEX TO VOL. XXV.

A.

B.

C.

D.

E.

F.

G.

L.

M.

N.

T.

U.

V.

W.

Y.

Z.

LONDON: R. CLAY, SONS, AND TAYLOR, BREAD STREET HILL, E.C.